

# NETWORK WORLD

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## HP readies new versions of OpenView

By Jim Duffy and Wayne Eckerson  
Network World Staff

FORT COLLINS, Colo. — Hewlett-Packard Co. this week is expected to announce new versions of its OpenView network management system that offer improved SNMP support, an enhanced graphical user interface (GUI) and access to SQL databases.

The new versions, OpenView 3.0 and 3.1, are expected to include technologies selected for inclusion in the Open Software Foundation, Inc.'s Distributed Management Environment (DME), such as a DME-compatible GUI and the Consolidated Management-application program interface (CM-API), which allows applications to utilize a range of management protocols.

OpenView 3.0 will ship this month, while OpenView 3.1 will be available in the third quarter, according to analysts briefed by the company. Both versions will run on HP's Unix-based 9000 Series processors, Sun Microsystems, Inc. SPARCstations and IBM's RISC System/6000 work-

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David Hauger, product manager for IBM's Network Server Product Entry Systems Division, reaffirmed IBM's LAN server commitment.

## NASA to lay out five-year OSI migration strategy

By Ellen Messmer  
Washington Correspondent

WASHINGTON, D.C. — The National Aeronautics and Space Administration this month will reveal a novel, five-year Open Systems Interconnection migration strategy.

The agency is taking a two-phased approach that calls for migrating proprietary protocols, such as IBM's Systems Network Architecture, to a set of interim protocols, including the Transmission Control Protocol/Inter-

net Protocol and, ultimately, to OSI.

Under the Government OSI Profile (GOSIP) requirements, all new federal network purchases must conform to open systems protocols.

Lynwood Randolph, chief of management programs at NASA, said the GOSIP Management Steering Group formed last year meshed scattered initiatives at NASA into a uniform migration strategy. The group is now await-

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## IBM airs first server, details strategic plan

With rollout of new PS/2 Model 95, execs chart future course to line of fault-tolerant LAN servers.

By Caryn Gillooly  
Senior Editor

NEW YORK — IBM last week introduced what it billed as its first local network server and mapped out its server strategy, which includes plans for high-end, fault-tolerant machines.

The new server, a member of the Personal System/2 Model 95 line, comes with error-checking and error-correction memory as well as error logging and bus parity checking — features that distinguish the device as a bona fide server, according to IBM.

"Historically, we've [offered] generic PCs," said David Hauger, product manager for IBM's Network Server Product Entry Systems Division in Boca Raton, Fla. "But we have declared publicly today that we are committed to the LAN server business. We want to take customers from this little, inexpensive, least-cost server up to the biggest, most exotic thing customers are asking for."

According to Hauger, IBM will provide three tiers of server products.

At the low end, IBM will continue to offer its desktop-class PS/2 Model 57 SLC as a server capable of handling basic file and

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**INSIDE:**

Special section explores changing SNA, user plans.

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- ☐ IBM alters SNA's stripes. Page 33.
- ☐ DRDA plays key role in distributed nets. Page 36.

## Introduction pending for secure SNMP

By Maureen Molloy  
Senior Writer

The Internet Engineering Task Force (IETF) is expected to deliver the long-awaited SNMP Security Protocol early this summer, a development that will ultimately give users greater control over internetworking devices.

The use of the Simple Network Management Protocol for monitoring devices has flourished — even without security — due to operational necessity. However, most vendors are reluctant to employ SNMP to control or configure devices in the absence of adequate security protection, according to Keith McCloghrie, associate director of engineering at Hughes LAN Systems, Inc.

John Pickens, director of common software and architecture at 3Com Corp., agreed. "When SNMP provides the ability to do

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### NETLINE

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- SYNOPTICS** to roll out host of token-ring products. Page 4.
- INFONET WILL LAUNCH** an international service that supports integrated SNA and LAN traffic. Page 4.

## Agency's leading-edge net to be cornerstone of NREN

By Ellen Messmer  
Washington Correspondent

WASHINGTON, D.C. — The Department of Energy tomorrow will accept bids for a wide-area cell relay network that will serve as the cornerstone for the National Research and Education Network (NREN).

The Energy Department's Energy Sciences Network (ESnet) Fast Packet Services request for proposal represents the agency's contribution to NREN, the federally backed effort to achieve gigabit-speed networking in five years.

As the government's first NREN purchase, the ESnet fast packet net promises to be a crown jewel for the long-distance carrier that wins the contract.

Pushing the boundaries of today's technology, the Energy Department is looking for a carrier to provide by October a 45M bit/sec network based on Switched Multimegabit Data Service (SMDS) that can be upgraded to support 622M bit/sec Synchronous Optical Network (SONET) speed at the end of five years. The agency's RFP establishes Asynchronous Transfer Mode (ATM) as NREN's underlying technology.

Initially, six Energy Department sites will be linked by the virtual network. Those locations will use high-speed dedicated links into the selected carrier's

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# Two local carriers set to air advanced data services

PacBell to introduce its fractional T-1 options; Southwestern Bell to unveil frame relay offering.

By Bob Wallace  
Senior Editor

Two local carriers are readying advanced data services that will work hand in hand with offerings from long-haul carriers.

Pacific Bell is scheduled to announce next week a fractional T-1 service, dubbed Flexible High Capacity (HiCap) Channel Mileage that will support speeds of 256K, 384K, 512K and 768K bit/sec.

Also, Southwestern Bell Corp. has announced it will deploy frame relay service across its five-state region by year end through upgrades to its Northern

Telecom, Inc. DMS-100 central office switches in 12 cities.

Pacific Bell's Flexible HiCap service will bridge the gap between its Advanced Digital Network, a 64K bit/sec private-line service, and its HiCap T-1 service.

"Full T-1 service is too much bandwidth for many customers," said Rob Volker, Flexible HiCap product manager at Pacific Bell Data Communications Group. "With this service, they can have the benefits of our HiCap service at the speeds and prices that meet their specific needs."

Flexible HiCap will be accessible.  
(continued on page 6)

# IBM-Candle effort produces automated mgmt. platform

Interface links NetView, Omegacenter products.

By Michael Cooney  
Senior Editor

LOS ANGELES — IBM's SystemView management architecture got a major boost last week when Candle Corp. announced the delivery of a bidirectional interface between its Omegacenter suite of system management products and IBM's NetView.

The new interface is a SystemView-compliant link that will let the two products share management data, enabling users to manage systems and network resources from a single platform.

The interface is implemented in Omegaview, a member of Can-

dle's Omegacenter family of mainframe-based system management products. The new offering Omegacenter products can send system management data to NetView via the interface. It also gives NetView access to management data from non-IBM systems via AF/Remote, an Omegacenter component capable of monitoring systems from vendors such as Digital Equipment Corp., Stratus Computer, Inc. and Tandem Computers, Inc.

Omegacenter users receive direct access to all topology and net status information from NetView.

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# Ascend unveils inverse mux for multiple applications

By Bob Brown  
Senior Editor

ALAMEDA, Calif. — Ascend Communications, Inc. last week announced an inverse multiplexer that lets as many four applications simultaneously share switched transmission facilities.

Ascend also detailed net management facilities for its new Multiband Plus inverse muxes and hinted about two soon-to-be-announced products that will help the company address the high end of the switched access service market.

These products will include an inverse mux hub featuring sup-

port for far more applications and net interfaces than current Multiband products, as well as a product that makes it easier to wire multiple devices into a Multiband inverse multiplexer. Further details were not available.

Ascend's new Multiband Plus will enable four applications, such as LAN-to-LAN interconnection or videoconferencing, to share a common pool of up to 3M bit/sec of switched service bandwidth. Current Multiband products support only a single application.

Ascend currently dominates  
(continued on page 5)

## Briefs

**Start-up readies frame relay switch.** Start-up Cascade Communications Corp. of Westford, Mass., today will unveil a line of Reduced Instruction Set Computing-powered frame relay switches. Cascade's STDx line will initially be targeted at carriers to let them extend the reach of their frame relay networks but will later be aimed at the end-user market. The switches are said to have features that help users optimize frame relay nets and prevent congestion.

**Novell unloads SNA products.** Microdyne Corp., an Alexandria, Va., network hardware and software vendor, today will announce that it has acquired Novell, Inc.'s Systems Network Architecture gateway software and related network interface cards.

Microdyne will take over sales, support and development of the products. The products became expendable to Novell after the company introduced a NetWare Loadable Module that performs many of the same functions, analysts said.

**Council urges new rules for outage reporting.** The Network Reliability Council last week decided to recommend that the Federal Communications Commission lower the threshold for when carriers are required to report network outages. Under current FCC rules, carriers must immediately report outages of 50,000 lines lasting 90 minutes or longer. The council — a group of about two dozen vendors and a handful of users that make policy recommendations to the FCC — will recommend that the threshold be lowered to 30,000 lines and outages be reported within 30 days.

**Standards for sale.** Vienna, Va.-based Omnicom, Inc. announced the release of "The 1992 Omnicom Index of Standards," which lists more than 3,000 published and draft standards from 23 international and national organizations. The index contains detailed information on Open Systems Interconnection, frame relay and network management standards, among others. Priced at \$297, it can be purchased by calling (703) 281-1135.

**Andrew goes the distance.** A new token-ring hub announced last week by Andrew Corp. of Torrance, Calif., will stretch the territory of 16M bit/sec networks running over unshielded twisted-pair cabling. The extended distance multistation access unit (MAU) is the first 16M bit/sec passive token-ring repeater that will use phase locked loop (PLL) technology. PLL will extend the maximum reach of an unshielded twisted-pair token-ring lobe to 900 feet, about twice the current limit, Andrew claimed. The new MAU, scheduled to ship in June, costs \$1,995.

**Lotus to offer Notes application library.** Lotus Development Corp. last week introduced an on-line catalog of 50 sample applications for Notes designed to help users and resellers build Notes applications easier and faster. Users can dial into the library, which is housed on a server at the company's Cambridge, Mass., headquarters to download applications free of charge.

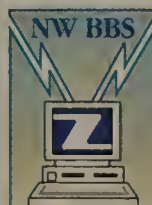
**Worldspan nabs AT&T discounts.** AT&T and Worldspan Travel Agency Information Service of Atlanta, a computer reservation network company, last week announced a program under which Worldspan's 8,500 travel agency subscribers can receive a discount of as much as 20% off AT&T's Pro WATS outbound calling service rates.

## CONTACTS



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# Access/One software lets users divide LAN data load

LANs can be split into multiple subnetworks.

By Maureen Molloy  
Senior Writer

SANTA CLARA, Calif. — Ungermann-Bass, Inc. last week announced new software for its Access/One Enterprise Hub that will let users segment hub-based LANs into multiple virtual local-area networks.

The Virtual Network Architecture (VNA) software resides on a Reduced Instruction Set Computing (RISC)-based Access/One interface module and works with the hub's PlusBus message-switching backplane to allow users to create virtual work groups.

It can also be used to provide dedicated bandwidth to workstations (see "Hub vendors ready transition to ATM," page 15) and to reduce the number of bridge/routers needed to link the hub's multiple LAN segments.

VNA will enable net managers to define virtual Ethernet, token-ring or Fiber Distributed Data In-

terface subnetworks across the hub's 400M bit/sec PlusBus backplane by splitting the bandwidth among logical subgroups such as employees in different departments.

"A software change is all that's needed to accommodate the addition of a new LAN [subgroup]," said Mick Scully, Ungermann-Bass' business unit leader for multimedia. "The user does not need to purchase another hub."

## Convenient configurations

With VNA, a virtual network can be configured and altered via software from a single management station, eliminating trips to a wiring closet.

According to Scully, the combined virtual network and switching architecture of the PlusBus will overcome the limitations of contention-based LAN backplanes that leave users vying for a

fixed amount of bandwidth.

In those environments, a single workstation running a bandwidth-hungry application can adversely affect overall network performance.

In contrast, VNA software on the RISC-based modules divides the hub's bandwidth among multiple virtual subgroups, providing each with a fixed amount of bandwidth. This keeps subgroups using bandwidth-intensive applications from disrupting other users.

In addition, the software will provide port-to-port switching so a packet destined for a particular node is sent to that node only and not to every node on the LAN.

The new architecture will also improve management by trimming the number of internet-working devices needed to link the hub's multiple LAN segments.

A bridge/router can connect directly to the PlusBus' switching infrastructure. Since all logical subnets share the same backplane, only one bridge/router is required to switch traffic between the various subgroups.

The VNA software will be incorporated into Access/One LAN cards by the fourth quarter. Pricing has not yet been set. **Z**

# Cisco beefs up security of its bridge/router software

By Maureen Molloy  
Senior Writer

MENLO PARK, Calif. — Cisco Systems, Inc. announced last week it will enhance its bridge/router software to provide greater data integrity for Systems Network Architecture and token-ring traffic traveling across routed internetworks.

The vendor said it will add flow control to the Logical Link Control 2 (LLC2) termination

feature it announced in January. That feature limits the amount of acknowledgment data forwarded over wide-area links ("Cisco to flesh out SNA routing strategy," *NW*, Jan. 13).

LLC2 termination enables a local Cisco router to acknowledge receipt of LLC2 packets on behalf of the remote node for which the packet is destined. That lets the router skirt the time limit SNA requires for data acknowl-

edgments, which, in turn, enables an SNA session to remain active even if the data path supporting the session fails.

The flow control feature builds on this capability by throttling token ring-attached end stations when the bridge/router's buffer reaches capacity, essentially quieting the end station until the congestion clears. Since congestion can lead a bridge/router to begin dropping packets, the flow control ensures more reliable delivery of SNA data.

"Robustness is a key requirement in many IBM environments," said Michael Zadikian, *(continued on page 50)*

# Netlink lets SNA devices attach to Ethernet LANs

By Michael Cooney  
Senior Editor

RALEIGH, N.C. — Netlink, Inc. will announce today a new release of its SDLC Link Server that lets users connect traditional SNA devices to Ethernet local-area networks and offers improved management features.

SDLC Link Server is a hardware/software platform that converts IBM Synchronous Data Link Control packets into 802.2 Logical Link Control 2 (LLC2) format for transmission over a LAN. It lets IBM gear, such as controllers or minicomputers, con-

nect to LANs for communications across internetworks rather than leased telephone lines.

SDLC Link Server Version 1.0 provides attachment to token rings, and the new Release 1.1 provides the option of connecting to Ethernet LANs. The enhanced version also features new IBM NetView support that lets an administrator monitor and control devices attached to the SDLC Link Server.

"Netlink's SDLC Server is both a migration tool to bring existing products to the LAN environment and a service product for old

equipment," said Dick Boyle, program director for local-area communications at Gartner Group, Inc. in Stamford, Conn.

Added John McConnell, vice-president of Infonetics Research Institute, based in Boulder, Colo., "There are a lot of Ethernet users out there not well-supported by IBM. This product will go a long way in addressing their needs."

## SDLC's in control

The SDLC Link Server's NetView management agent will allow NetView operators to activate or deactivate SDLC lines or devices attached to the device. Previously, NetView could not control devices or lines beyond the SDLC Link Server.

"The [SDLC] Link Server col- *(continued on page 51)*

# SynOptics to unveil suite of token-ring products

By Bob Brown  
Senior Editor

NEW YORK — SynOptics Communications, Inc. this week will unveil a pair of stand-alone 16M bit/sec token-ring work group concentrators and a token-ring bridge for its System 3000 chassis-based wiring hub.

SynOptics is also investigating adding support for multiple Ethernets in the System 3000, which can be configured to simultaneously support two token rings, three Fiber Distributed Data Interface nets and one Ethernet. Further details were not available at press time.

The System 3000 is facing increased competition from emerging third-generation hubs from companies such as Hughes LAN Systems, Inc., analysts said.

"SynOptics will make moves to significantly extend the System 3000's life," said Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif., market research firm. "Supporting just one Ethernet is the bottleneck for SynOptics' hub users."

While further details about the System 3000 enhancements were scarce, sources were better informed on the token-ring products expected this week. The 16M bit/sec Model 2700 token-ring work group concentrators have 16 ports and are designed as stand-alone or rack-mountable

devices ("SynOptics readying router module, token-ring hubs," *NW*, Dec. 30/Jan. 6).

SynOptics will also roll out a token-ring work group concentrator that can be managed using the Simple Network Management Protocol as well as an unmanaged work group concentrator. The hubs can be cascaded together, allowing unmanaged hubs to be managed by the other devices.

The hubs will support 16M bit/sec token ring over unshielded twisted pair based on jointly developed SynOptics/IBM technology ("IBM, SynOptics devise 802.5 wiring scheme," *NW*, Nov. 11, 1991) and shielded wiring.

The 2700 work group concentrators vary in price. The 2705 (unmanaged) costs \$2,395, the 2715-03 (basic SNMP) costs \$3,995, and the 2715-04 (advanced SNMP) costs \$4,795.

SynOptics is also expected to unveil a local source routing token-ring bridge, dubbed the 3522, for the System 3000 wiring hub, analysts said. The bridge, based on technology licensed from Madge Networks, Ltd. over a year ago, will enable users to link two token-ring nets, they said. The \$8,000 bridge is designed to switch up to 9,000 packet/sec.

SynOptics is expected to cut the price of its System 3000 token-ring modules, although the firm did not provide details. **Z**

# Infonet set to launch new global internetwork service

Offering lets companies merge SNA, LAN traffic.

By Bob Wallace  
Senior Editor

EL SEGUNDO, Calif. — Infonet Services Corp. is expected this week to announce a new international service that supports integrated SNA and LAN traffic.

Infonet's SNA/LAN is designed for multinationals that maintain parallel IBM Systems Network Architecture and local-area network internets and want to merge all traffic onto a single service, according to sources who requested anonymity.

Analysts concurred, saying users could sharply reduce monthly line costs by eliminating duplicate links. For example, a user with two 56K/64K bit/sec leased lines between the U.S. and Europe pays an average of \$16,000 a month. With Infonet's service, it would only need one circuit supporting both SNA and LAN

traffic for \$8,000 a month.

"There's no one today that provides a service that enables users to consolidate multiple nets by [supporting] SDLC and LAN on a single backbone," said Peter Sevcik, a senior consultant with Technology Management International, Inc., a Cambridge, Mass., consultancy. "And Infonet can do it on a global basis."

*(continued on page 51)*

**Correction:** A recent graphic showing local carrier trials with fiber optics ("Local carriers dabble with fiber trials," *NW*, April 20) reversed Ameritech's listing. The regional Bell holding company is conducting two fiber-to-the-curb trials and no fiber-to-the-home trials.



## IBM, Candle produce mgmt. platform

*continued from page 2*

Using the Omegacenter products AF/Performer, AF/Operator, AF/Remote and Omegamon, users can collect performance data on DB2, CICS, IMS, MVS, VM and VTAM systems, combine it with NetView's network management data, display it on a central console and program automatic responses to failures using NetView or Candle's AF/Operator.

"The combination of Omegacenter and NetView will give IBM shops the ability to monitor and proactively correct problems before they cause problems for users," said Arnold Farber, president of Farber/LaChance, Inc., a data center automation consultancy in Richmond, Va. "It creates an all-inclusive, automated system that could change the way users do business."

Until now, Candle's Omegacenter com-

municated with NetView via a VTAM interface, which is slower, more complicated and limited the data Omegacenter products could send to NetView, according to analysts. The new interface sets up a peer relationship between the two systems using the direct Primary Programming Interface in NetView Release 2.

The interface is a boon for SystemView, which some pundits have dismissed as a "plan for a plan," with very little in the way of real products to anchor it.

"This is just the sort of product announcement SystemView needs," said

John Varanelli, director of operations for system management research at the New Science Associates, Inc. consultancy in Southport, Conn. "Candle's strong automation features and NetView's network management capabilities will be a useful combination for users. This is the wave of the future for enterprise monitoring."

Candle has a reputation for providing strong products for system and operation management, said Atul Kapoor, a principal at Kaptronix, Inc., a Haworth, N.J., consultancy. "IBM has promised that NetView will become stronger in these areas, but for

now, this is a logical solution."

Robert Kivi, a net consultant for CAP Gemini America of Canoga Park, Calif., a worldwide systems integration firm, is using the interface to monitor Motorola Codex 9800 management systems in a large user shop. Motorola Codex alarms are forwarded to NetView and then through the new interface to Omegacenter's AF/Operator, which delivers automated responses and enables the data to be displayed on an Omegaview screen. "We used to code this path by hand, but now it'll be included in the product," Kivi said. **□**

## Ascend unveils inverse multiplexer

*continued from page 2*

the low end of the inverse multiplexer market, but company officials acknowledged the need to address more complex user needs in an interview last year.

Inverse multiplexers signal carriers to establish multiple 56K and 64K bit/sec calls on an as-needed basis. The mux then pools the bandwidth into a single contiguous pipe to support applications such as videoconferencing.

Jennifer Pigg, a program manager at The Yankee Group, a market research firm in Boston, said Ascend's support for multiple applications is important as users look to support a wider range of needs with inverse muxes.

That theme was echoed by Jay Duncan, an Ascend cofounder. "Customers were satisfied with Multibands for tying a single videoconferencing system into the switched network, but kept asking us how they could tie another system in or how they could tie LANs in," he said.

Other inverse mux vendors, such as Promptus Communications, Inc. of Portsmouth, R.I., and Teleos Communications, Inc. of Eatontown, N.J., already support multiple applications, said Bruce Guptill, an associate at TeleChoice, Inc., a Montclair, N.J., consultancy.

Ascend's Multiband Plus muxes, like the original Multibands, will support T-1 and Integrated Services Digital Network Primary Rate and Basic Rate access to switched offerings. They will support V.35 and RS-449/RS-422 interfaces on the user side. Ascend has also added network management capabilities to Multiband Plus, such as the ability to assign priority status to a specific application to guarantee it bandwidth during busy hours.

Multiband Plus will support Ascend's proprietary inverse multiplexing technology as well as that proposed by the Bandwidth on Demand Interoperability Group, a group of inverse multiplexer vendors trying to develop interoperability standards.

Multiband Plus muxes will be priced from \$5,500 to \$9,500, depending on configuration. Ascend plans to announce a plan that will enable users to upgrade from existing Multibands to the new product. **□**

## THE INTELLIGENT HUB MARKET IS FULL OF INFLATED CLAIMS.



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**Does it eliminate work?** Other hubs

make you run to the wiring closet and patch in reconfigurations by hand. Fact: The 7700 hubs do that work for you. And we can demonstrate it. Ask other vendors what they can demonstrate.

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## Two local carriers set to air services

*continued from page 2*

ble from 300 points of presence, he said. Additional centers will be added based on customer demand. With Flexible HiCap, users can start with a 256K bit/sec fractional T-1 link and upgrade to 384K, 512K, 768K or 1.54M bit/sec speeds as needed.

The upgrade can be achieved by submitting a service order and waiting three business days for the additional bandwidth or requesting that Pacific Bell expedite the order, in which case the channels will be added in one business day, Volker said.

Pacific Bell will use the T-1 extended superframe format (ESF) to monitor the links' performance, according to Volker. ESF will enable the carrier to spot degradation in line quality and test circuits without taking the facility out of service.

Flexible HiCap is a clear-channel service that uses bipolar eight zero code substitution line coding, meaning customers obtain the full 64K bit/sec channel for data transmission. The older alternate mark inversion line coding scheme uses 8K bit/sec for transmission management, leaving only 56K bit/sec for data transmission.

Pacific Bell has proposed a distance-sensitive pricing structure for Flexible HiCap under which users will pay \$8 per mile for a 256K bit/sec link, \$9.50 per mile for a 384K bit/sec line, \$11 per mile for a 512K bit/sec connection and \$13 per mile for a 768K bit/sec link. The service carries a \$125 monthly charge as well as variable installation and monthly HiCap local-loop fees. Comparatively, a 25-mile, 768K bit/sec link would cost roughly 25% less than a 25-mile HiCap T-1 circuit, Volker said.

Pacific Bell has asked the California Public Utility Commission for approval to begin offering Flexible HiCap in June.

While Pacific Bell is focusing on fractional T-1 service, Southwestern Bell is finalizing its plans for the frame relay rollout. The carrier, which is one of the first regional Bell holding companies to detail plans for frame relay, said it will file tariffs for the service later this year.

"Customers' need to interconnect LANs was the top consideration in our decision to offer frame relay," said Marty Tanner, product development manager for local-area network interconnection services. "But there are other applications, like distributed computing and CAD/CAM, that can use frame relay, as well."

The company will upgrade switches in other cities based on user demand. It expects at least some need for the service in Springfield, Mo., and Beaumont, Texas.

Southwestern Bell's frame relay service will support 56K and 1.536M bit/sec port access speeds, and ultimately, an intermediate port access speed will also be offered. The service has yet to be priced. **■**

### Southwestern Bell details frame relay plans

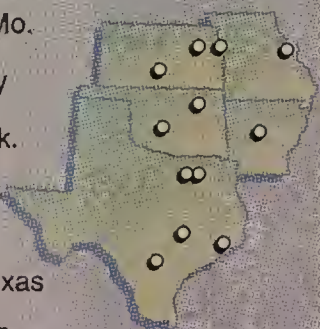
**Platform:** Northern Telecom, Inc. DMS-100 central office switch

**Availability:** Later this year

**Access port and permanent virtual circuit speeds:** 56K bit/sec, an undetermined intermediate speed and 1.536M bit/sec

#### Initial cities:

Kansas City, Mo.  
St. Louis  
Oklahoma City  
Tulsa, Okla.  
Little Rock, Ark.  
Topeka, Kan.  
Wichita, Kan.  
Austin, Texas  
Dallas  
Fort Worth, Texas  
Houston  
San Antonio, Texas



SOURCE: SOUTHWESTERN BELL CORP., ST. LOUIS  
GRAPHIC BY SUSAN J. CHAMPENY

At DECworld '92 in Boston last week, Microsoft Corp. Chairman William Gates (r., with DEC Chairman Ken Olsen) waxed philosophical on the DEC-Microsoft plan to port Microsoft's Windows NT to DEC's Alpha hardware platform ("Microsoft, DEC to align architectures," *NW*, April 27).

Gates said applications written for a range of computers with different user interfaces — including pen-based and speech recognition techniques — will need to access resources on centralized computers. "That's a problem DEC and



Microsoft have been thinking about a lot," he said. "The machine at the desktop will get smaller and smaller and support a wider variety of [interface] techniques."

## NASA to lay out OSI migration plan

*continued from page 1*

ing top-level agency approval on its NASA Management Plan for GOSIP Implementation.

"We have a variety of network protocols," Randolph said. "We're trying to eliminate some protocols unsuitable for wide-area networking."

### Five-year haul

The NASA plan proposes a five-year transition. In the first three years, TCP/IP, Digital Equipment Corp.'s DECnet and Novell, Inc.'s Internetwork Packet Exchange (IPX) will be designated as so-called short-term protocols and used in NASA's 10 space centers. During that period, networks using IBM's Systems Network Architecture, Apple Computer, Inc.'s AppleTalk and Xerox Corp.'s Xerox Network Systems will be transitioned to the three short-term protocols.

After the three-year period, NASA will transition DECnet, IPX and TCP/IP direct-

ly to OSI. "We don't see ourselves as able to transition everything at once," Randolph said. "The ultimate goal is to develop NASA's intercenter wide-area network through exclusive use of GOSIP network protocols."

NASA settled on DECnet, IPX and TCP/IP as the three short-term protocols because they are the most prevalent, both within NASA's own net and in the agency's communications with outside groups, including universities and government contractors.

Once the basic migration strategy is approved this month, the next step will be to create working groups to formulate coexistence plans between OSI, TCP/IP and other protocols, Randolph added.

"In addition to the transition, we must carry on the day-to-day work," he said.

The NASA Management Plan lists a number of approaches NASA is prepared to consider. The agency will evaluate so-called protocol-based alternatives, including multiprotocol stacks and application- and transport-layer gateways.

NASA will also look at what it calls service-based alternatives. Those will include transport-service bridges, which support multiple transport protocol options and network tunneling, the encapsulation of one protocol inside another for transport.

NASA will establish 12 working groups under an Inter-Center Committee for Computer Networking and give it six to 12 months to define a coexistence plan, Randolph said. NASA's close ties to major contractors, such as The Boeing Co., Rockwell International Corp., McDonnell Douglas Corp. and others, will require the agency to coordinate its networking activities with these key partners, as well.

NASA's proposed migration strategy hardly represents a vote of user confidence in OSI. Randolph said a marketplace analysis done by NASA concluded that OSI products are not available, a factor compelling NASA to proceed slowly with its OSI transition.

"That is the opinion of people at the agency who looked at the products," Randolph said. But he added that the OSI dilemma appeared to be a chicken-and-egg problem where users may not find what they want because vendors, convinced users are not willing to buy OSI products, have not developed them.

Another factor impeding OSI is the lengthy period needed to develop international standards, which has left the OSI protocol suite incomplete, he said. **■**

## Can You Tell Who's Using Teleglobe's New V.32bis Modem?

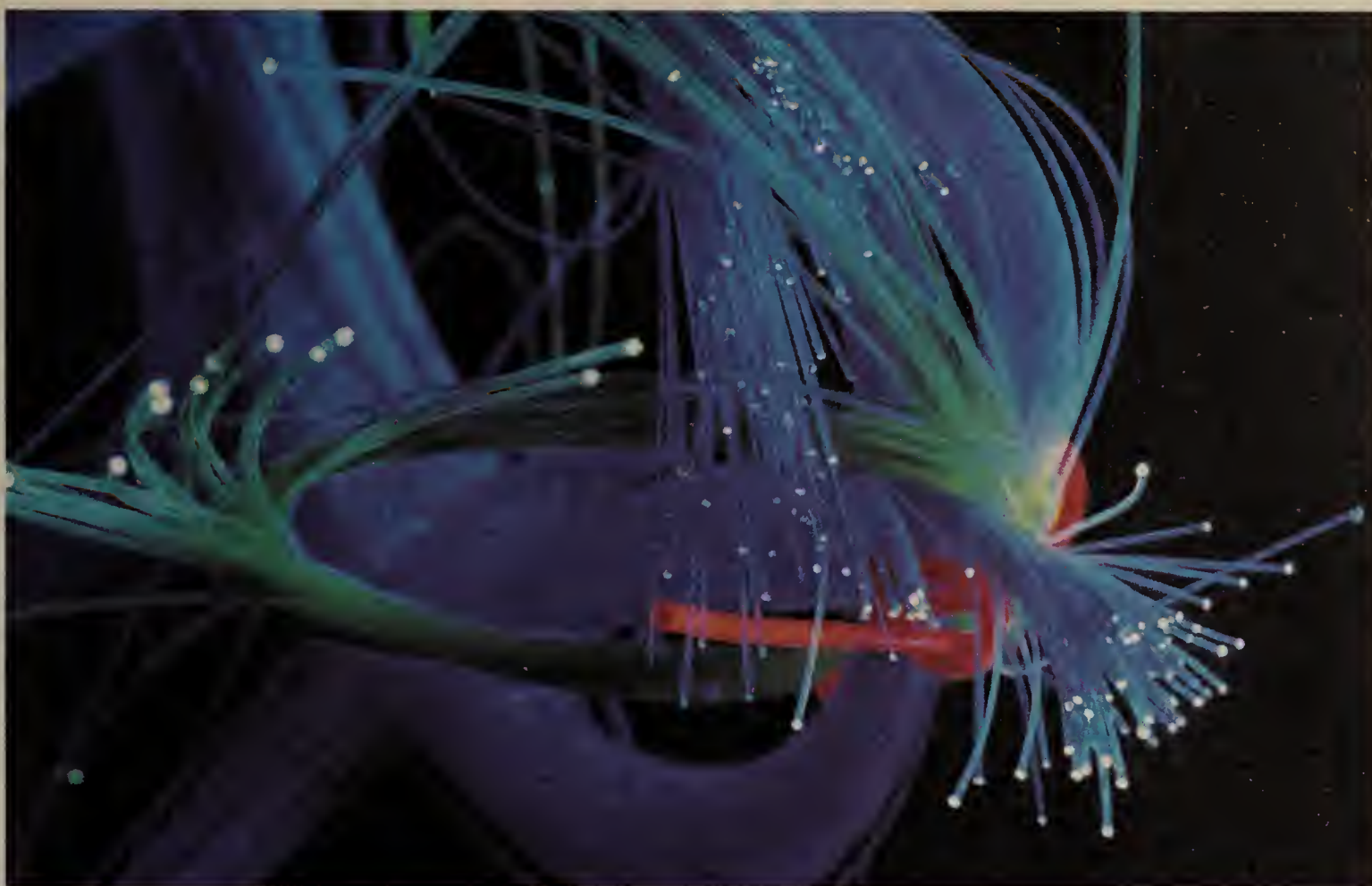


Teleglobe's DA 3214 modem is setting the industry ablaze with a line rate of 14.4 kbps over standard phone circuits, 57.6 kbps using V.42bis compression. But there's more to the DA 3214 than speed. No other modem performs better under adverse line conditions. And the DA 3214 is backed by Teleglobe's 20 years of communications experience. Call Teleglobe today at 1 800-926-3225 ext. 3200 or fax us at 1 508-681-0660.



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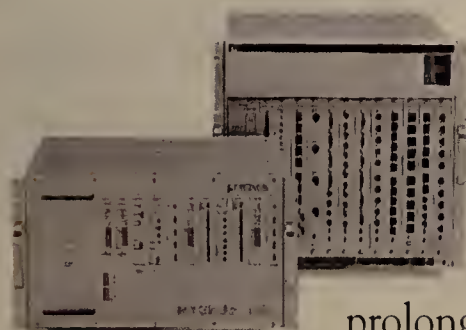


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**THROUGHPUT**—Selected models offer MNP<sup>®</sup> levels 4 and 5 for error control and data compression; others comply with V.42 bis, offering MNP or LAP-M compression for throughput rates up to 38,400 bps. V.32 bis and UNIX variations are also available.

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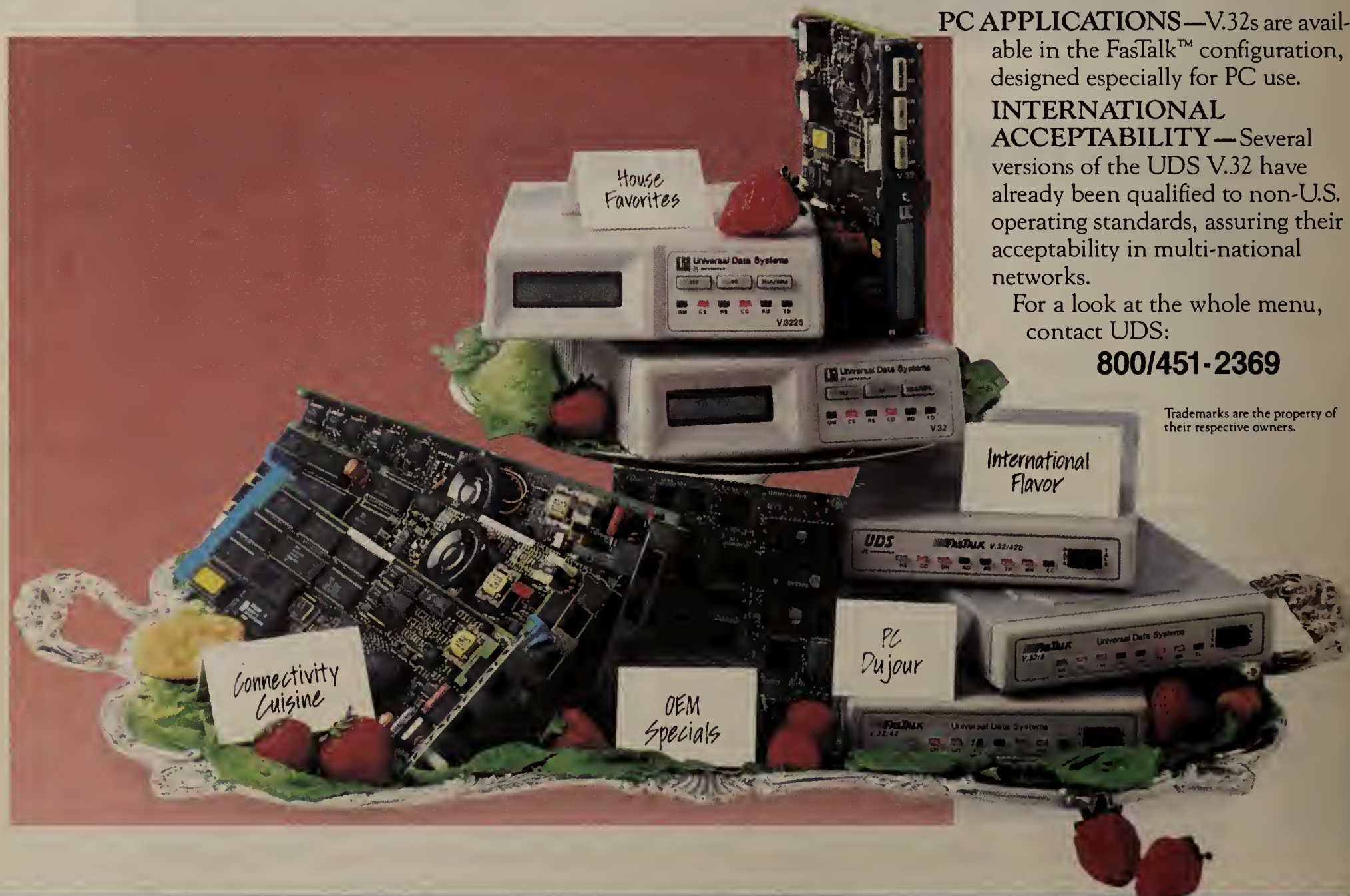
**PC APPLICATIONS**—V.32s are available in the FastTalk<sup>™</sup> configuration, designed especially for PC use.

**INTERNATIONAL ACCEPTABILITY**—Several versions of the UDS V.32 have already been qualified to non-U.S. operating standards, assuring their acceptability in multi-national networks.

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# DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

## Worth Noting

“**F**rame relay [service] is the moral equivalent of a dedicated line.”

**James Michaels**  
Assistant vice-president of  
network planning  
Newbridge Networks, Inc.  
Herndon, Va.

## CNT unveils DASD interface for Channelink extenders

Tool links mainframes to DASD over any distance.

By Jim Duffy  
Senior Editor

MAPLE GROVE, Minn. — Computer Network Technology Corp. (CNT) has brought out an interface that works with its Channelink channel extenders to let users connect mainframes with IBM direct-access storage devices (DASD) over unlimited distances.

The new DASD interface is a set of hardware modules for the Channelink extender that includes separate physical interface cards for different wide- and local-area links. It provides users with connectivity to mainframe DASD systems, disk arrays and other disk systems at remote sites over T-1 and DS3 lines as well as 100M bit/sec Fiber Distributed Data Interface LANs.

The DASD interface can also support High Speed Serial Interface links to bandwidth managers, which then connect to remote DASD sites over DS3 lines.

There are no limitations to the distance between a user at a data center and the remote storage site, according to a CNT spokesman.

The DASD interface also includes hardware modules that control routing and perform error checking.

The product is optimized for applications such as duplicating critical data in two or more storage sites to back up a data center. Another application is consolidating disk storage facilities to reduce costs and improve access to on-line data from multiple sites.

The DASD interface provides users with advantages over offerings from CNT competitors, the spokesman said. Unlike channel extenders from Network Systems Corp., Channelink does not require the mainframe host to run specialized communications software or perform extra processing to access remote storage devices, the spokesman said.

Also, users can deploy the same Channelink extenders to access DASD storage devices that they use for mainframe channel-to-channel, channel-extended tape and print, and Transmission Control Protocol/Internet Protocol connectivity, the spokesman

(continued on page 10)

## Sync Research offers new mgmt. pack for SNAC/TR

By Michael Cooney  
Senior Editor

TUSTIN, Calif. — Sync Research, Inc. last week announced software distribution and management features for its Systems Network Architecture Network Access Controller for Token Ring (SNAC/TR) concentrators.

The new personal computer-based software, SNAC/Talk, provides a direct interface to the Network Management System (NMS) already included with SNAC/TR. The new feature lets users configure and manage their existing remote SNAC/TR concentrators from a central site as well as transfer files between them.

SNAC/TR converts Synchronous Data Link Control traffic from IBM controllers to 802.2 Logical Link Control 2 (LLC2) traffic, enabling it to run over IBM Token-Ring local-area net-

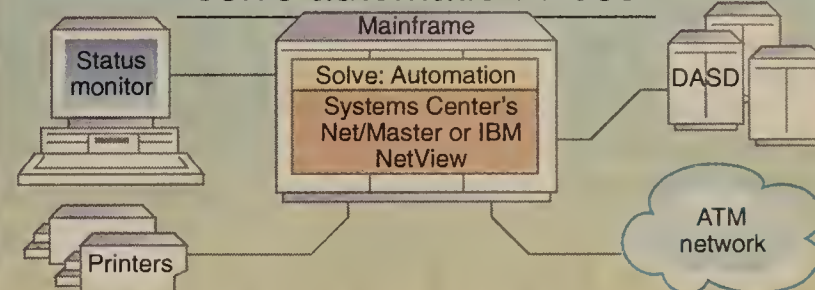
works. Once in LLC2, the data is sent over remote bridges, through the LAN internetwork and up to the host. SNAC/Talk sits on the Token Ring and monitors traffic for errors.

SNAC/Talk runs on a Token Ring-attached, DOS-based IBM PC AT with an IBM 4/16 Token-Ring Adapter. It can monitor and update as many as eight SNAC/TRs on the local or remote Token-Ring LAN. The PC does not need to be dedicated to the SNAC management function.

Users can configure or reconfigure the SNAC/TR from the PC by sending down commands or updated files to the SNAC/TR's NMS, which configures, manages and monitors the box. SNAC/Talk PC also lets users collect diagnostic data, such as protocol trace files, from the SNAC/TRs.

(continued on page 10)

## Systems Center seeks to solve automation woes



Systems Center's new network monitoring package, dubbed Solve: Automation, can automatically adjust to accommodate changes in the status of network resources. From a color monitor, net assets, such as all printing facilities or DASD devices, can also be managed according to logical subnets.

DASD = Direct-access storage device

SOURCE: SYSTEMS CENTER, INC., RESTON, VA.  
GRAPHIC BY SUSAN J. CHAMPENY

## Systems Center airs automation software

Second pack in Solve series lets users automate mgmt. of individual devices or logical subnets.

By Michael Cooney  
Senior Editor

RESTON, Va. — Data center managers can keep a more watchful eye on their critical resources thanks to new automation software from Systems Center, Inc.

The new mainframe-based software, Solve:Automation, removes or automates responses to many of the tedious, day-to-day messages that data center operators receive. Using a rules-based system, the package lets users monitor and automate responses to messages from individual devices, such as printers or storage facilities, or entire logical subnets.

The new software is the second in an expected series of Solve products. Solve:LAN for OS/2, introduced in January, is an OS/2-based local-area network monitor (“Systems Center airs mgmt. tool for token-ring LANs,” *NW*, Feb. 3).

### The new generation

Solve:Automation replaces the company's SYS/Master, an automation development tool that allowed users to develop their own Net/Master automation features. The new software does not require Net/Master, Systems Center's network management offering, or IBM's NetView package but will work with both products.

“Solve:Automation is a full-blown, off-the-shelf automation product,” said Walt Thomas, director of product marketing at Systems Center. “It builds on the SYS/Master tool kit but supports

more rules and interfaces to other subsystems, such as IBM's [Resource Access Control Facility].”

### Product capabilities

Solve:Automation lets users capture device, system and subsystem messages and display those messages to system operators. Operators can monitor a number of resources as a group, automate responses to the most important system messages and eliminate mundane messages.

Operators can, for example, monitor the status of an entire payroll system, rather than have operators correlate alarms from individual components of that system, Thomas said. If any resource that makes up the payroll system fails, a red “traffic light” flashes on the monitor. Solve:Automation can then provide additional details on the failure, and if programmed to do so, reactivate the system.

“Rules can be written for the system to respond to failures, but the user has to write them,” Thomas said. “The condition of the monitored device or subsystem appears on a centrally located status monitor that comes with the system.”

The ability to control resources automatically from that central location has been a major user requirement for years, analysts said. The product should also increase network resource availability by getting failing resources back on-line quicker.

“This product addresses traditional centralized console func-

(continued on page 10)

## Data Packets

As expected, **Ascom Timeplex, Inc.** last week rolled out a low-end feeder multiplexer to its Link+ family (“Ascom Timeplex to unveil mux for low-end market,” *NW*, April 27). The new entreeLink+ offers 44 I/O ports and synchronous or asynchronous data channel speeds ranging from 56K bit/sec to T-1. The box can grow to support two T-1 lines.

The new mux will be available in July for prices starting at \$5,200.

**The Wollongong Group, Inc.** has unveiled Network File System (NFS) file-sharing software that can run over Digital Equipment Corp.'s Transmission Control Protocol/Internet Protocol stack for VMS or Wollongong's own WIN/TCP for VMS.

PathWay Client NFS for VAX/VMS 2.1 allows users of Sun Microsystems, Inc.'s NFS file-sharing protocol to access and share files and run applications that reside on local or remote VMS NFS servers.

PathWay Client NFS for VAX/VMS 2.1 is now available and priced from \$1,000 to \$5,000.

**Telebit Corp.** has rolled out a V.32bis dial-up modem it claims can achieve a throughput rate of 70K bit/sec.

The Telebit WorldBlazer modem derives its high speed from an enhanced version of

(continued on page 10)



## Systems Center airs automation software

*continued from page 9*

tions, but it allows the user to concentrate on critical components," said Arnold Farber, president of Farber/LaChance, a data center automation consultancy in Richmond, Va. "It really takes a business approach to data center automation."

Other analysts agreed, saying users can expect other Solve products.

"This software should help users centrally manage remote, distributed sites,"

said Dave Passmore, a principal with the Ernst & Young, a consultancy in Vienna, Va. "The whole Solve series is expected to be a family of management offerings."

Thomas acknowledged that adding enhancements to the Solve:Automation product, which are expected in June, will include access to IBM Application System/400 resources and additional rules support for more devices.

Solve:Automation Release 1.0 is available now starting from \$16,000. Pricing will be determined by processor size, according to the company. **■**

## CNT unveils channel extender interface

*continued from page 9*

said. Network Systems customers have to operate two separate networks for DASD and other channel-extension applications, he said.

IBM's Enterprise System Connection (ESCON) channel is another rival to the Channelink extender, although ESCON's distance limit is 5.5 miles for DASD connections, IBM said.

User requirements for networked

DASDs have also increased substantially in the last 12 years, the CNT spokesman said. Citing data from an IBM report on MVS system storage management, he said storage capacity in data centers has grown from 9G bytes in 1978 to 1,157G bytes in 1990.

The increase in storage volume necessitates access to storage devices wherever they reside, the spokesman said.

CNT's DASD interface will support IBM 3380, 3880, 3390 and 3990 disk systems, as well as disk arrays and solid-state disk drives from Storage Technology Corp. and EMC Corp.

Support for the IBM 3380 and 3880 disk drives is planned for third-quarter availability. CNT also plans to add support for Storage Technology and EMC disk systems during that time frame. Support for IBM's 3390 and 3990 storage devices is planned for the fourth quarter.

Pricing for Channelink systems that include the new DASD interface will range from \$81,000 to \$150,000. **■**

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LANMODEM includes a V.32bis/V.42bis internal modem.

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access. **✚** To find out how LANMODEM can open up some remote possibilities for your network,

## Firm offers mgmt. pack for SNAC/TR

*continued from page 9*

One Fortune 500 SNAC/Talk beta user, who requested anonymity, said he used the new Sync software to monitor his SDLC lines. "It acts like a real-time scope on the line," the user said. "This feature was a requirement for us because we don't have anyone dedicated to network management tasks at our remote offices. Now we can see what's going on from a PC located at the data center."

The center can also monitor SNAC/TRs through IBM NetView, analysts said. By using SNAC/Talk, however, users can off-load some of the lower level LAN management functions, such as SDLC trace and diagnostics, without involving the NetView operator.

SNAC/Talk is now available and is offered free to existing SNAC/TR users. SNAC/TR costs about \$9,600 for a four-controller supporting system. **■**

## Data Packets

*continued from page 9*

the company's proprietary Packetized Ensemble Protocol (PEP). The TurboPEP protocol, with its Trellis coding, error-correcting techniques and additional modulation, is said to enable the device to transmit at 70K bit/sec instead of the V.32bis standard rate of 14.4K bit/sec.

WorldBlazer is also designed to accommodate speeds up to 115.2K bit/sec through data compression, Telebit said. The modem is available now at a price of \$1,099 for a stand-alone version and \$1,049 for a rack-mounted model.

**Simpact Associates, Inc.** was awarded a \$1.6 million contract to supply defense contractor E-Systems, Inc. of St. Petersburg, Fla., with communications servers and software for a U.S. Air Force missile tracking system.

Simpact's CNS 6200 server will enable E-Systems to integrate Digital Equipment Corp. computers into the Air Force Systems Command's Survivable Communications Integration System. **■**



# LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

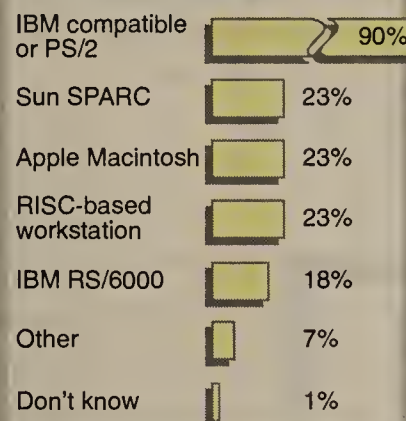
## Worth Noting

“For people who only wanted to mow their lawn, IBM [was selling] Caterpillar [Inc.] heavy equipment.”

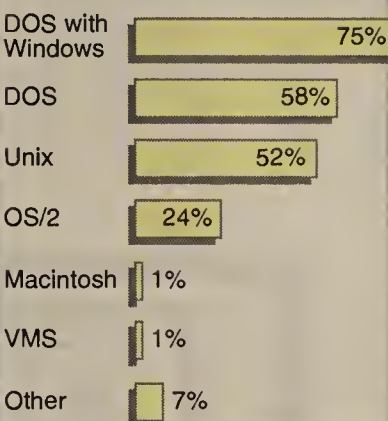
Tom Nolle  
President  
CIMI Corp.  
Voorhees, N.J.  
Commenting on why IBM's OfficeVision/2 was never successful

## Systems integrators speak out on client/server

Which client platforms are typically supported by your company's client/server platforms?



Which client workstation operating systems will you be using in 2 years?



Figures are based on a poll of 103 systems integrators.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

## Proteon to up throughput of 16M token-ring boards

Bus-mastered interface uses RapiDriver software.

By Maureen Molloy  
Senior Writer

WESTBOROUGH, Mass. — Proteon, Inc. today will announce its next-generation Industry Standard Architecture (ISA) token-ring adapter card that will enable users to achieve throughput of up to 15.2M bit/sec across 16Mbit/sec token-ring local-area networks.

The ProNET-4/16 p1392 features a new bus master direct memory access interface that works with the vendor's RapiDriver software to achieve almost full 16M bit/sec wire-speed performance. This contrasts with other 4M/16M bit/sec token-ring adapters that offer average throughput of about 6M bit/sec, according to Proteon.

“This product is equipped

“The product is equipped with the power to support demanding networked applications.”



with the power to support increasingly demanding networked applications,” such as network management and client/server applications, said Bob McGeary, vice-president of marketing for

net interface cards at the company.

The new adapter is based on Proteon's Advanced Software Architecture, introduced last fall (“Proteon off-loads net tasks

Distributing network tasks to the adapter increases workstation performance.



from PCs to net interfaces, *NW*, Nov. 4, 1991), which increases efficiency and eases so-called RAM-cram by off-loading communications applications from the workstation to the adapter.

Distributing network tasks to the adapter increases workstation performance by alleviating random-access memory bottlenecks. It can also conserve as much as 63% of a DOS-based personal computer's memory to support client/server and other emerging applications.

The p1392 also employs erasable programmable read-only memory circuit technology to reduce costs tenfold in diskless workstation applications.

Available now, the p1392 costs \$795 and includes a lifetime warranty. ■

## Backup tools support Mac and Unix devices

Agents for Cheyenne's ARCserve backup program let NetWare 3.1 servers back up Mac, Unix files.

By Salvatore Salamone  
Features Writer

ROSLYN, N.Y. — Cheyenne Software, Inc. last week started shipping UNIXagent and MACagent software modules for its ARCserve for NetWare 3.1X backup and restoral program to simplify the task of backing up Apple Computer, Inc. Macintosh and Unix workstations.

Traditionally, it has been incumbent for Macintosh and Unix users in Novell, Inc. NetWare local-area networks to copy files to the file server where they would be backed up along with the file server to a tape drive.

The new software modules make backup and restoral of files easier by enabling ARCserve on the server to go out to LAN-attached Macintoshes or Unix workstations and directly back up files on these devices to a tape

drive connected to the file server.

The MACagent software runs as a NetWare Loadable Module (NLM) on the file server and is used in conjunction with the NLM version of ARCserve.

Using MACagent with ARCserve allows files on System 6.05 to 7.01 Macintoshes to be backed up to a tape drive connected to the server.

The agent also allows users to monitor the backup and restoral of files in real time via a viewing window. MACagent is only compatible with an ARCserve NLM.

UNIXagent is an NLM that allows backup and restoral of files on Unix workstations running The Santa Cruz Operation, Inc. SCO Unix System V/386 Release 3.2. As with MACagent, UNIXagent must be used in conjunction with an ARCserve NLM.

(continued on page 12)

## ALR bolsters performance of Powerpro server line

By Joanne Cummings  
Senior Writer

IRVINE, Calif. — Advanced Logic Research, Inc. (ALR) has announced a new line of local-area network servers that offer faster performance than previous offerings, but at a slightly higher cost.

The new ALR Powerpro 486DX2/50 line is based on Intel Corp.'s 50-MHz 486DX2/50 chip and costs just \$300 more than the Powerpro 486/33, which was based on a 33-MHz chip. The new servers can perform compute-intensive tasks about 40% to 50% faster than the Powerpro 486/33.

The Powerpro 486DX2/50 is available in three floor-standing models, all of which support the Novell, Inc. NetWare, The Santa Cruz Operation, Inc. SCO Unix Version 3.2.2 and Banyan Systems, Inc. VINES SMP operating systems. They are designed to support work groups of between 20 and 40 users, according to ALR.

The 5CV model is a 12-slot unit that supports two proprietary cards for the system's CPU and cache memory, eight Extended Industry Standard Architecture (EISA) slots and two ISA slots. It has 8K bytes of internal random-access memory cache and a math coprocessor.

The 5CV also has an integrated module that provides 256K bytes of external read/write RAM cache for increased system performance. Previously, the cache module was entirely separate from the CPU, which tended to slow performance.

### Memory capacity

The 5CV can be configured to support dual processors via two optional ALR proprietary i486DX/50-MHz modules, each with 512K bytes read/write RAM cache. The server comes standard with 5M bytes of RAM, expandable to 49M bytes on a single board.

Users can also purchase (continued on page 12)

## Netnotes

The client software for Novell, Inc.'s NetWare network operating system seems to be in constant flux. New versions of drivers, protocols and shells, as well as bug fixes, are posted in NetWare, the company's CompuServe, Inc. forum, on almost a monthly basis. To make the updates more widely available, Novell recently decided to allow users to order them by telephone. The latest Workstation Kit for DOS/Windows offers updated drivers and tools that shipped with Microsoft Corp. Windows 3.1 in addition to other bug fixes and enhancements. It can be purchased for \$30 by calling (800) 873-2831.

Network General Corp. last week began shipping its \$15,500 Expert Sniffer net analyzer, which not only decodes, but also assists managers in interpreting network traffic, a boon to those dealing with rising expectations and shrinking budgets, said managers at the announcement. The original Sniffer now sells for \$12,500, including support for 13 protocol suites, a setup that previously sold for as much as \$28,000.

Digital Products, Inc. of Waltham, Mass., has introduced a printer-sharing device that will let IBM 3270 end users share personal computer (continued on page 12)



## Backup tools support Mac, Unix devices

*continued from page 11*

Both products were developed to accommodate the growing number of Macintosh and Unix workstations being added to NetWare LANs, according to Reijane Huai, vice-president of engineering at Cheyenne.

Making the \$495 agents optional will enable customers to buy only what they need. "Not everyone has Unix and Macintosh workstations, so instead of rolling everything into one package and increasing

the price, the agents are offered as options," said Lisa Merkin, the company's marketing director.

MACagent and UNIXagent can be used with other Cheyenne software modules. Currently, the company offers agents for DOS, Microsoft Corp. Windows and OS/2 environments. The agents, called DOS-agent, WINagent and OS/2agent, are included with the ARCserve 4.0 software at no additional cost.

Cheyenne also started shipping Changer and Stacker software modules for ARCserve.

The Changer module works with many leading tape changers used for file backup and restoral. A tape changer contains multiple cassettes in a magazine and can load and unload the tapes as needed. The Changer software directs the tape change operation.

The Changer software module substantially reduces the amount of time net managers spend handling tapes. When restoring a file, for example, ARCserve will select

the proper tape in a magazine, put that tape into the tape drive and start the restoral operation automatically. Changer is priced at \$1,195.

The Stacker module works with tape stackers, which back up and restore files by automatically accessing tapes sequentially and moving a new tape into the drive when an old tape is full. Using the Stacker module with ARCserve 4.0 minimizes tape handling and makes it unnecessary for an operator to be present if a second tape is needed for backup. The Stacker module costs \$695.

Stacker and Changer, when used with ARCserve, make restoral operations transparent to the user employing a Changer or Stacker device. Given the proper tapes in a magazine, ARCserve will locate the next available tape for backup or the appropriate tape for file restoral. ■

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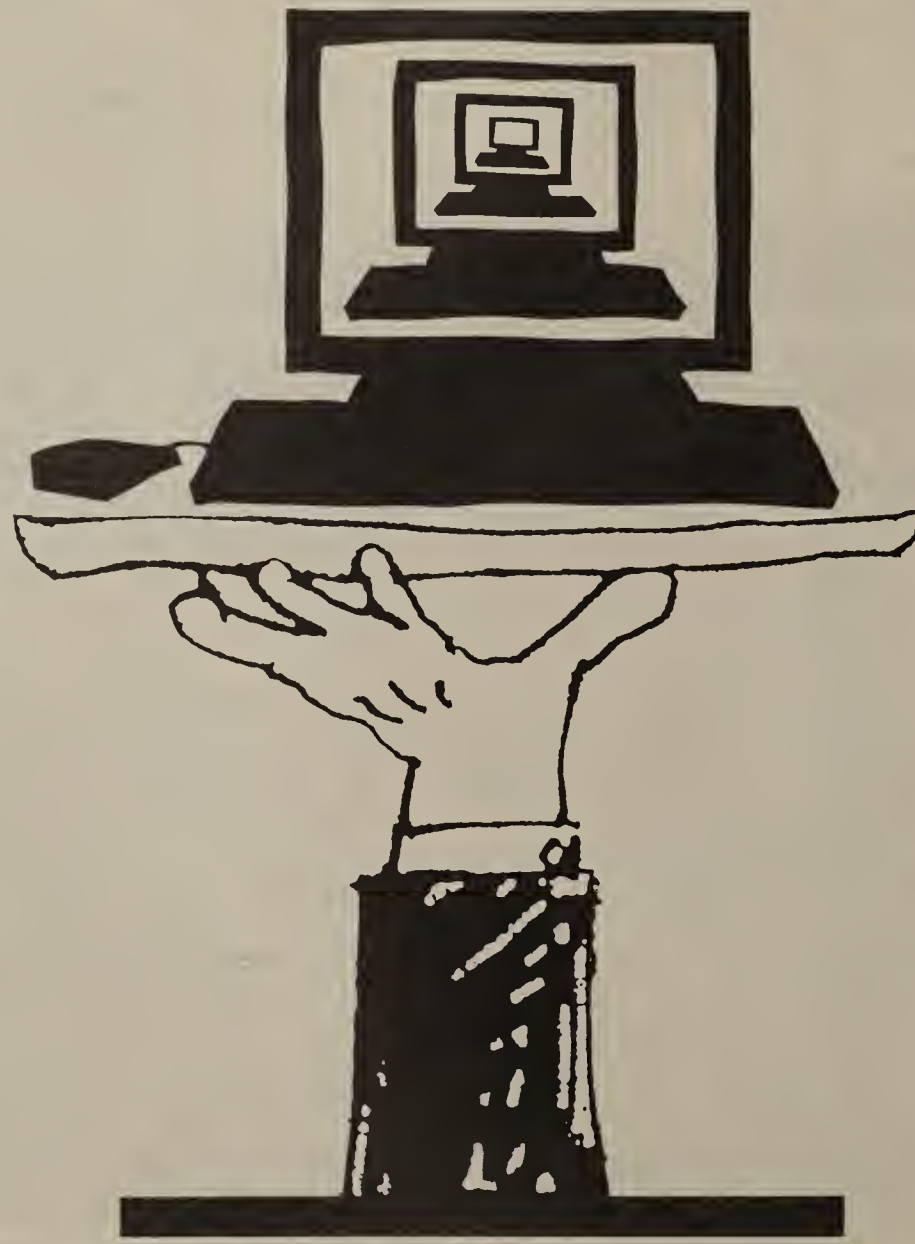
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## ALR bolsters Powerpro line

*continued from page 11*

Powerpro EISA Memory Expansion Modules to expand the RAM to 305M bytes.

The 5CV also has an integrated device electronic and floppy interface for external drives.

The 340-5CVS and 535-5CVS models offer the same features as the 5CV, but the 340-5CVS comes with a 340M-byte Small Computer System Interface (SCSI) hard drive and a 32-bit SCSI controller, while the 535-5CVS is shipped with a 535M-byte SCSI hard drive and a 32-bit SCSI controller.

The new servers are scheduled to be available this month. The 5CV is priced at \$5,295, the 340-5CVS costs \$6,995, and the 535-5CVS is priced at \$7,495. The optional dual-processing modules are priced at \$1,795, and the Memory Expansion Modules cost \$499. ■

## Netnotes

*continued from page 11*

local-area network-based laser printers. Called NetCommander 10G, the device has a built-in 3287 protocol converter, translating from IBM to ASCII character sets. It comes with eight serial and two parallel ports and is available now for \$2,495.

Walker Richer & Quinn, Inc. last week announced a new version of its Reflection Network Series set of networking protocols that will provide token ring-based terminal-emulation sessions from personal computer local-area network nodes to Unix-based host computers. The previous version only provided these capabilities over Ethernet connections.

Reflection Network Series 2.0, slated to ship in July, will have an IBM Network Basic I/O System interface for connecting to different versions of LAN Manager servers. According to the Seattle-based company, new management capabilities will eliminate the need for users to specify which transport they want to connect to which host. That will now be done automatically via the product's new Connection Manager feature.

Pricing for the Network Series 2.0 was not available at press time. ■



# WHY KEYCORP IS BRANCHING OUT WITH GDC.

With branches reaching from Fort Kent, Maine, to Dutch Harbor, Alaska, KeyCorp – “America’s neighborhood bank”<sup>SM</sup> – is one of the fastest-growing financial institutions in the U.S. Whenever KeyCorp adds another branch to the 730 Key Bank offices it already has, it relies on GDC to help quickly achieve “backroom standardization.”

KeyCorp managers consider their communications network a major strategic asset. And they know it’s vital to get each new bank integrated as quickly as possible. That’s why they turn to GDC, their strategic partner for networking products, services, and support.

KeyCorp planners have standardized on GDC analog and digital access products. For their backbone network, they use the GDC Transport Management System. And their entire network is managed by a GDC Integrated Network Management System.

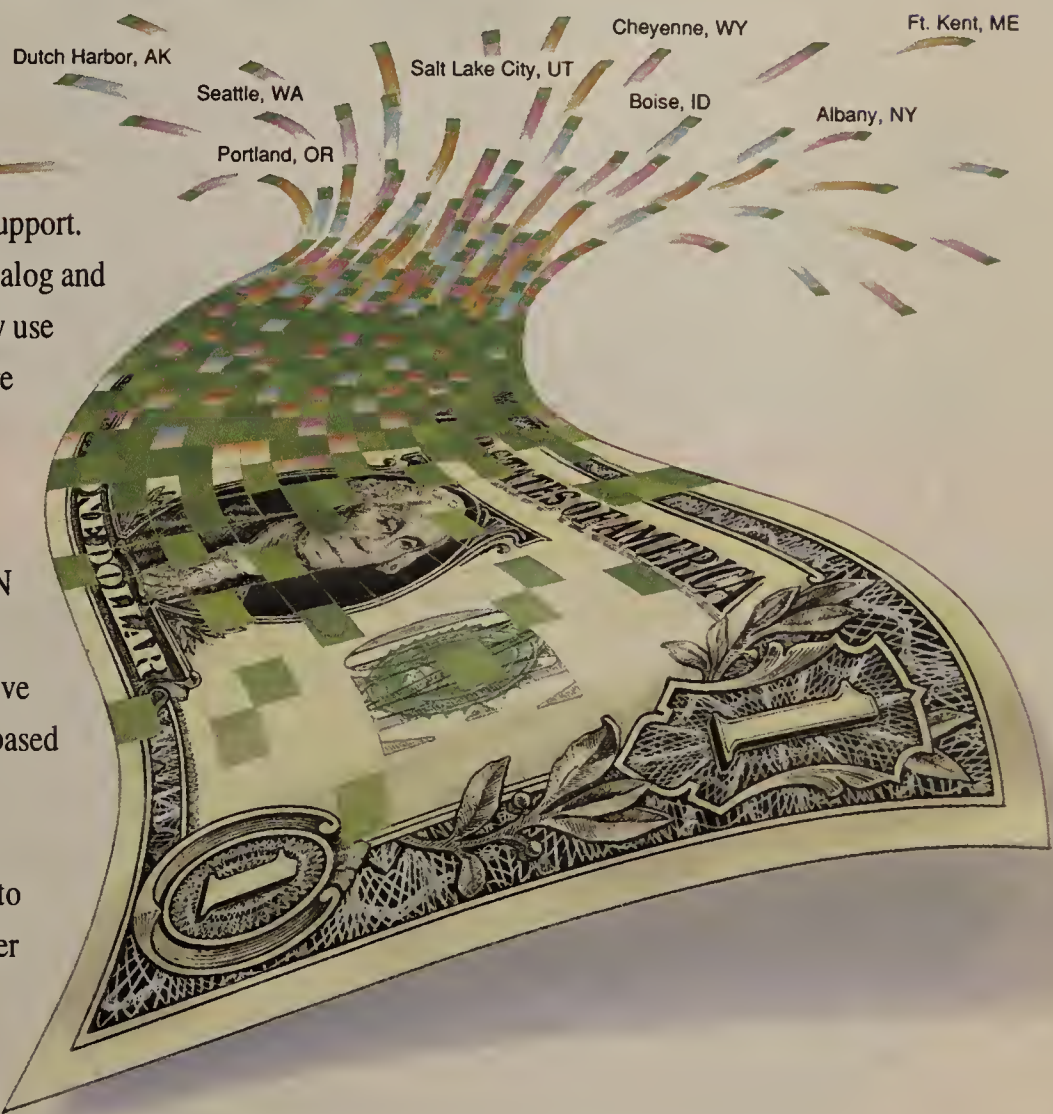
GDC supports LAN-to-WAN connectivity for internetworking of all KeyCorp offices. Each includes LAN traffic, voice, image, and other data applications.

GDC is also helping KeyCorp convert its extensive regional data enterprise network from analog- to digital-based technology.

Through its 6-year partnership with GDC, this innovative financial services company has utilized GDC to help lower costs, speed up performance, enhance customer service, and improve its edge in a highly competitive banking environment.

KeyCorp has found that GDC has the right products, the right network architecture, and the right vision to offer a reliable migration path to the communications technologies of the future. We think you’ll find the same.

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PROGRAM UPDATE

Telecom/MIS  
Managers Invited!

## Gateways to Knowledge™



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Exhibition

ICC '92  
International  
Conference on  
Communications

June 15-18, 1992  
McCormick Place  
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SUPERCOMM® '92  
International  
Conference and  
Exhibition

ICC '92  
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Conference on  
Communications

June 15-18, 1992  
McCormick Place  
Chicago, Illinois

### Who We Are

SUPERCOMM® '92  
Co-sponsors:



Based in Washington, D.C., USTA represents 1,100 local exchange telephone companies throughout the United States.



The 500-member association headquartered in Washington, D.C. represents manufacturers and suppliers of telecommunications equipment and services.

ICC '92 Sponsored by IEEE's  
Communications Society:



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Engineers

An organization with over 300,000 members worldwide, IEEE promotes the interests of the electrical engineering profession.



IEEE COMMUNICATIONS SOCIETY

This 30,000 member group within IEEE keeps electrical engineers with communications interests abreast of emerging computer and communications technologies.

**N**ow is the time to get ready for the biggest telecommunications event of the year. And it all begins by reading this comprehensive booklet that describes the broad array of seminars, exhibits, forums, and panel discussions that will take place.

Once again, SUPERCOMM will co-locate with the International Conference on Communications (ICC) – this year in Chicago at McCormick Place. This world-class exhibition and two premier conferences promise to be even more exciting, informative and global than ever before.

Over 450 exhibiting companies and 20,000 industry professionals from more than 80 countries are expected to attend. This is your chance to meet and network with potential customers, worldwide teaming partners, the innovators changing our industry, leading telcos, interexchange carriers, telecom/MIS managers, and more.

### There's So Much To See And Do

Imagine, three series of programming ranging from non-technical to technical. Plus, the largest collection of telecommunications equipment – all under one roof. Also, new product demonstrations that will change the way you think about telecommunications. There's so much to see and do at SUPERCOMM/ICC '92! You'll be able to choose from the following:

### Tuesday - Thursday Are Free Exhibit Days

You'll need all those days to see the more than 400,000 square feet of high-tech displays and new product introductions as company after company show off the best they have to offer. *Please remember, the exhibits will not be open on Monday.*

### Seminars And Lectures On Three Different Levels

Three different educational levels plus many tutorials and workshops – you choose the tracks which will

benefit you most, and the speakers will bring you insight into a multitude of telecommunications issues.

**100 Series** Attend 43 free SUPERCOMM '92 non-technical seminars where you'll get a practical education and enter into lively Q & A on important and timely subjects ranging from fiber in the loop and network reliability to SONET and fast packet.

**200 Series** Also, approximately two dozen applications-oriented sessions are targeted to SUPERCOMM attendees by ICC '92. This practical and inexpensive programming will be most valuable to telcos, interexchange carriers, and telecommunications professionals from both public and private networks who need a somewhat technical viewpoint.

**300 Series** In addition, there will be more than 50 moderately priced ICC '92 technical sessions sponsored by the Communications Society of The Institute of Electrical and Electronics Engineers.

**400 Series** For technically-oriented professionals seeking an overview, ICC '92 also offers eight full-day and half-day tutorials and workshops.

### Three Morning Features – All Presentations Free

#### Monday ICC Plenary Session



Northern Telecom's Vice President of Technology Planning, Frank Splitt, chairs a panel discussing the changing world of inter-

national telecommunications. This session will provide attendees with valuable insights into world trade, as well as the impact of the European Economic Community. Also, CCITT's Director, Theo Irmer, will share his perspectives on international telecommunications standards and



Telefonica International's Chairman, Enrique Used Aznar, will outline the progress made in modernizing Spain's telecommunications network.

### Tuesday Joint Plenary Session

"Learning to Compete in a Market-Driven Wireless World" will be the subject of Motorola Chairman George Fisher. As keynoter he will discuss the driving force behind Motorola's success and tell us what we need to know about wireless communications and how it's going to affect us. This field continues to grow in importance as we move into an Information Society where mobile transmission of data to network-based computers is expected to multiply exponentially.



Motorola Chairman George Fisher

### Wednesday Morning Session



Highlights include the role of telecommunications in education and complement the SuperSchool display, Ameritech's

centerpiece demonstration at SUPERCOMM/ICC '92. There will be a panel discussion led by Denis Philip Doyle, Senior Fellow at the Hudson Institute and an education consultant, speaker and author. Among his books is *Winning the Brain Race: A Bold Plan to Make Our Schools Competitive*, co-authored with U.S. Deputy Secretary of Education David Kearns. The panel will

address the forces behind the restructuring movement in education, with the aim of identifying "technology fit," what technology offers education and opportunities this market offers the telecommunications industry.

### Major Addresses At ICC '92 Luncheon On Monday And Banquet On Tuesday



The Awards Luncheon will feature William L. Weiss, Chairman and CEO of Ameritech. Weiss will offer insight on a theme of knowl-

edge is power and provide ideas of what technologies and policies are needed for an Information Society.

ICC '92 fee applies.



At the ICC '92 Annual Banquet, George H. Heilmeyer, the new President and CEO of Bell Communications Research, will share his

vision of an information infrastructure of pervasive, broadband, intelligent networks providing "Information Age capabilities for everyone."

Bellcore provides research and other technical support to the Bell Region-

al Holding Companies, Cincinnati Bell Telephone Co. and Southern New England Telephone Co.

ICC '92 fee applies.

### SUPERCOMM Program Participation By A Wide Variety Of Organizations

From the Association of Data Communications Users to the Pacific Telecommunications Council and the Caribbean Telecommunications Council, leading organizations will conduct SUPERCOMM '92 seminars and bring you cutting-edge presentations. From the editors of *Communications Week* and *Communications News* to *TE&M*, *Telephony*, *Network World*, and *Business Communications Review*, you'll learn about leading issues and how they'll affect you.

### New Matching Service Will Schedule Private Business Meetings At SUPERCOMM '92

*Counterpart* Business Matching Service will match and schedule companies for private one-on-one meetings at SUPERCOMM. Participating companies may choose the companies and the countries for the meetings. Meetings help SUPERCOMM companies expand sales, establish distributorships, or develop joint ventures in the U.S. or internationally. For more information and *Counterpart* registration forms, please contact Dr. Noreene Janus, Executive Vice President, *Counterpart*. Phone: (703) 524-8704, Fax: (703) 524-8705.

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Wednesday, June 17: 9 am - 5 pm  
Thursday, June 18: 9 am - 3 pm  
(No exhibits on Monday, June 15)



## The Premier Corporations Are Here

Major manufacturers are coming from all over the globe to show their products. Join us to see what the exciting world of telecommunications has to offer again this year!

- A** ACS Communications, Inc.  
ACT Print Systems  
ADC Telecommunications, Inc.  
Adirondack Wire & Cable  
ADK Pressure Equipment Corp.  
ADSCO Line Products  
Adtran  
Alcatel  
Alcoa Fujikura Ltd.  
Alpha Technologies  
American Computer & Electronics Corp.  
American Digital Switching  
American Electric  
Ameritec Corp.  
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AMP  
Anritsu America  
ANT Telecom  
AOFR, Inc.  
Applied Computing Devices  
Applied Digital Access, Inc.  
Applied Innovation  
ARNCO Corp.  
Ascom Warren  
AT&T Network Systems  
AudioSears  
Augat Communications Group
- B** Bally Engineered Structures  
Bard Mfg.  
Beco Mfg. Corp.  
Bell Atlantic  
Bellcore  
BellSouth  
Benner-Nawman  
Berry Co.  
Boston Technology, Inc.  
BroadBand Technologies  
Burnup & Sims  
Communications Services, Inc.  
Business Communications Review  
Butler Telecom, Inc.
- C** C&D Charter Power Systems  
CADTEL Systems, Inc.  
CANAC Telecom  
CANADA, External Affairs & International Trade  
Canoga-Perkins  
CAPS Logistics  
Carlson, a Division of Lamson & Sessions  
Carsonite International  
C-Can Power Systems, Inc.  
CEEEO  
CERJAC, Inc.

- Channell Commercial  
Cincinnati Bell Information Systems (CBIS)  
Coastcom  
Code-A-Phone  
Cognitronics  
Coil Sales & Mfg.  
Comdial Corporation  
Commercial Electric Products  
COMMSOFT-Communications Software Consultants  
Communication Equipment Brokers  
Communications Data Group  
Communications Mfg. Co.  
Communications News  
Communications Week/CMP Publications  
Communico Supply, Div. of Communico Inc.  
Communitel, Inc.  
Comshare  
Comunicaciones  
Concrete Systems, Inc.  
Condumex, Inc.  
Consultronics Ltd.  
Cordell Mfg.  
Crispaire Corp.  
Crowe Rope

- D** Datacom Technologies Inc.  
Datapro Information Services Group  
DBA Communications Systems Inc.  
DCM Industries  
Dielectric Communications  
Digital Transmission Systems  
Digitech Industries  
Ditch Witch  
DSC Communications  
Dukane Corp.  
Dura-Line  
Dynacom

- E** Easi File Corporation  
East Penn Mfg. Co., Inc.  
ECI Telecom  
EDS  
Electrodata  
Electronic Tele-Communications (ETC)  
Elgin Electronics  
Enghouse Systems  
Ericsson Components  
Ericsson Network Systems  
Evergood Fabrication Co., Inc.  
Excel, Inc.  
EXFO E.O. Engineering

- F** Famous Telephone Supply Co.  
FiberCorp, Inc.  
Fibrebond Corp.  
Fishel Co.  
Fitel General  
FOF Products  
Forces, Inc.

- Fortec  
Fujitsu Network Transmission Systems, Inc.  
FWT

- G** Generac Corp.  
GMP  
GNB Industrial Battery  
GN Navtel Ltd.  
GN Netcom  
Gordon Kapes, Inc.  
Grand Enterprises, Inc.  
Graphic & Data Solutions  
Grass Valley Group  
Graybar Electric  
GTE Corporation  
GTE Products  
GTE Supply  
GTE TestMark

- H** Harris/Dracon  
Harris-McBurney  
Hartford Concrete  
Harting Elektronik, Inc.  
Heath Consultants  
Hekimian Labs.  
HELLERMANN  
Hendry Telephone Products  
Henkels & McCoy  
Hewlett-Packard  
Homaco  
Hood Communications  
HUB Fabricating Co.  
Hysol Div., The Dexter Corp.

- I** Ideal Industries  
IEEE Communications Society  
Imaging Magazine  
Inbound/Outbound Magazine  
Independent Technologies  
Industrial Technology  
Information Publishing  
Integrated Network Corp.  
Intergraph Corp.  
Iowa Department of Economic Development

- J** John Wiley & Sons  
Johnson Controls, Specialty Battery Div.  
Joslyn Electronic Systems

- K** Keptel  
Klein Tools  
Kohler Co.  
Kontek Industries Inc.

- L** LaMarche Mfg. Co.  
Lancier Inc.  
Larus  
Laser Precision  
Leviton Mfg.  
Liebert Corp.  
Linkon  
Logica North America, Inc.



LorTec Power Systems/IPM  
Lynn Electronics

**M** Macrotel International  
Magnetek  
Mark Products  
Masterack div. Leggett & Platt  
Matt M. LaVail, Inc.  
Metro Tel  
Metrotech  
Micro Computer Systems  
Micro Integrated Communications Corp. (MICC)  
Microflect  
Microtronix Systems  
Microwave Logic  
Microwave Networks  
Mobile International  
Modular Protection Group  
Mohawk Wire & Cable Corp.  
Motorola  
Mountain Engineering & Technology  
Mustang Enterprises

**N** NEC America  
NEPTCO  
Network Communications  
Network World  
Networking Management Magazine  
Nevada Bell  
Nippondenso of Los Angeles, Inc.  
North Supply  
Northern Telecom  
NovAtel Communications  
Noyes Fiber Systems  
NTT (Nippon Telegraph & Telephone)  
Nutmeg Utility Products

**O** Octel Communications Corp.  
OMNI  
Onan Corp.  
ONEAC  
Outside Plant Magazine

**P** Pacific Microelectronics Centre  
PairGain Technologies  
Panamax  
Panduit Corp.  
Para Systems, Inc.  
Pen-Cell Plastics  
Peninsula Engineering Group  
Periphonics  
Photon Kinetics  
Photonics Spectra  
Pirelli Cable Corp.  
Plug-In Storage Systems (PSSI)  
Porta Systems Corp.  
Power & Telephone Supply Company  
Powersafe Standby Batteries  
Power Battery Co.  
Power Conversion Products  
Preformed Line Products  
Progressive Computing  
Protek, Inc.

Protel  
PSI Telecommunications  
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Pulsecom Div., Hubbell Inc.  
Pyramid Industries

**Q** Quadrum Telecom  
Quantel Systems, Inc.  
Quazite  
Quintrex Data Systems

**R** Radiation Systems/Mark  
Antennas Div.  
Radiodetection Corp.  
Rainbow Technology  
Random Corp.  
Ratelco  
Raynet Corp.  
Redcom Labs.  
Regal Electronics  
Reliable Communications Group  
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Remote Switch Systems  
R.J. Enterprises  
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**S** Saft Nife Corp.  
Saunders Telecom  
Schonstedt Instrument  
Science Dynamics  
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Seiscor Technologies  
Services & Materials Co.  
Siecor Corp.  
Siemens Solar Industries  
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Starkey Telecommunications  
Storm Products Co.  
StrataCom, Inc.  
Stratus Computer  
Sumitomo Electric Fiber Optics  
Summa Four  
Superior Teletec  
Suttle Apparatus  
Switchcraft  
System Studies Incorporated

**T** T.A. Pelsue  
Tadiran Electronic Industries, Inc.  
Taicom Systems Limited  
Tamaqua Cable Products  
Tandem Computers  
Tau-Tron  
T-Com  
Tekelec  
Tekno Industries, Inc.  
Tektronix  
Telamon

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Telco Systems  
Telcor  
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Telecommunications Magazine/  
C&C News  
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Teleconnect Magazine  
TELECT  
Tel electronics  
Telenex  
Telephone Engineer & Management  
Telephone International  
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Tellabs  
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Teltrend  
Tempo Research  
Teradyne, Inc.-Telecomm Div.  
Test Technology, Inc.  
Texas Instruments  
The Mart Magazine  
Thomas & Betts  
THOR Enterprises, Inc.  
3M Telecom Systems Group  
Time Mfg.  
TranSwitch Corp.  
Trimm, Inc.  
Triplett Corp.  
Trompeter Electronics  
TW Comcorp  
Tyton

**U** Underwriters Laboratories Inc.  
Unipage  
Unisys  
U.S. Intelco Networks  
United States Telephone Association (USTA)

**V** Vari-Tronics  
VFP  
VIDAR, Inc.  
Virgo Publishing

**W** Wandel & Goltermann  
Westell  
Wheelock  
Wicom  
Wilmore Electronics Co., Inc.  
Wiltron

**Y** York Group, The/MDL  
Enterprises Inc.  
Yuasa-Exide, Inc.

**Plus Many More**

List as of 2/6/92

Subject to Change



# Monday

No Exhibits

■ Primer

8:00 – 9:00 a.m.

## Plenary Session by ICC '92

9:30 – 10:45 a.m.

- **101 Synchronous Optical Networks (SONET) – An Update** – SONET was proposed as a universal fiber optic transmission interface standard in 1985. Refinements and enhancements have been developed. This primer describes the evolutionary path of SONET and projects future developments.
- 102 The Developing European Digital Cellular Market** – Europe is on its way toward covering the continent with a digital cellular (GSM) network – learn where the European Community is going.
- 103 The Evolving Information Environment: User Needs and Concerns** – Telecom managers discuss their voice and data needs in a world of mixed media information processing and transmission. New and faster communications are considered, as well as who should provide and control services.

11:00 a.m. – 12:15 p.m.

- 104 Applications and Implementations of SONET** – SONET has excellent potential as a versatile transport approach for a wide range of future services and network topologies. Panelists discuss applications, current equipment, and implementation strategies.
- 105 A Report Card on Investments in International Telecommunications** – An update and analysis of U.S. investments in the European Community (EC), Eastern Europe, South America, and the Far East. Good background for afternoon international sessions.
- 106 User Benefits of New Public Network Architectures** – Explore the implications and benefits of public network architectures – specifically Bellcore's Advanced Intelligent Network initiative – for corporate users.

2:00 – 3:15 p.m.

- **107 The Basics of CCS/SS7** – Many LECs are planning to offer advanced services through deployment of Common Channel Signalling networks utilizing Signalling System 7 protocol. This primer covers basic network architecture and protocols.
- 108 Opportunities in the Asia/Pacific Telecommunications Market** – Impressive changes are occurring in Asia/Pacific market opportunities. An involved panel identifies the changes and discusses current supplier opportunities.
- 109 User Management of New Public Network Services** – Managing telecommunications services is critical to the success of corporations. Learn how corporate users can increase the public network's value to better fulfill their needs.

3:30 – 4:45 p.m.

- 110 Harmonious Hybrids in the '90s** – Can private and public networks function in harmony? Users and vendors discuss strategies that work toward extending the reach of private networks while tapping public network functionality.
- 111 The Caribbean – Telecom Growth Market** – Telecommunications will play an important role in the growing Caribbean, Central and South American economies. Learn how to enter and participate in these opportunities.

3:30 – 5:15 p.m.

- 112 HDSL: The Value of COPPER Just Went Up!** – A high-speed copper transmission technology has arrived on the telecom scene: HDSL (High-bit-rate Digital Subscriber Line). Providers and vendors discuss this breakthrough in deployment for T1 and Fractional T1 services. Asymmetric Digital Subscriber Line also will be discussed.

# Tuesday

Exhibits Open:  
9 a.m. – 5 p.m.

■ Primer

8:00 – 9:00 a.m.

## Joint Plenary Session/Keynote Address

9:30 – 10:45 a.m.

- **113 Numbering Resources: Will We Run Out?** – As the basis for telecommunications, the availability of numbering services must be ensured by thoughtful planning. A look at issues threatening to exhaust numbering resources and measures guaranteeing them.
- 114 Where Will PCS & Cellular Meet in the Marketplace?** – Join this panel to explore how the wireless world of PCS/digital cellular will unfold and the roles each will play in serving residential and commercial customers.
- 115 Managing Growth in the Evolving Public Network** – Network evolution is requiring telcos to rapidly add network features. Small companies often do not have the expertise to handle these deployments; large companies are experiencing workforce cutbacks & regulatory pressure. The panel considers operational support in this environment.

11:00 a.m. – 12:15 p.m.

- 116 Exploring Transition to Competition** – A look at all major aspects of competition's impact on the industry. How today's policies are creating new opportunities (and risks) in a changing environment.
- 117 Information Services: Retail On-Line Transaction Processing and the LEC Approach to Improve Local Access** – LECs discuss their approach to improve performance and the cost of local access to retail on-line transaction processing networks, and why the phone company is still the best solution.
- 118 Money Matters: Fiber in the Loop – Part I** – The economics of fiber deployment are explored based on extensive field trial experiences and anticipated developments in products and costs.

2:00 – 3:15 p.m.

- 119 Planning Considerations for CCS/SS7** – Most new services under development are based on CCS/SS7 technology, so LEC understanding of various methods of implementing CCS is vital for financial growth. This session assists LECs in determining which equipment is appropriate for their company.
- **120 An Introduction to the World of Fast-Packet Switching – Part I** – An instructional overview of fast-packet, frame-relay, cell-relay, ATM, and SMDS – complementary or competitive? Applications? Who needs it?
- 121 New for '92: User Applications of ISDN** – Pronounced dead in 1989, ISDN is poised for a strong comeback in 1992. Users' interest in ISDN capability and the belated development of standards among providers is fueling this market renewal.

3:30 – 4:45 p.m.

- 122 Access Restructure – What's at Stake for Small Companies?** – Interstate access is increasingly subject to competition. Learn about the developing consensus among regulators and carriers to restructure the rules for this key LEC revenue source.
- 123 Video Customer Premise Equipment** – Video phones, multi-media, workstations, interactive CDs, personal computer windows: Consumer and computer industries on a collision course? How will video CPE emerge?
- **124 An Introduction to the World of Fast-Packet Switching – Part II** – Continuation of session #120 on frame-relay, cell-relay, ATM, and SMDS.



# Wednesday

Exhibits Open:  
9 a.m. – 5 p.m.

8:00 – 9:15 a.m.

## General Session

9:30 - 10:45 a.m.

- 125 The Basics of IN/AIN** – The deployment of advanced intelligent network capabilities provides for faster and better controlled introduction of new services provided by local exchange carriers. This panel explores the basic aspects of IN/AIN.
- 126 The Ameritech PCS Trial** – Ameritech plans to have a PCS trial “up and running” in Chicago by SUPER-COMM time. They report on planning, implementation, and trial observations.
- 127 Distance Learning: Linking Minds Across the Miles** – The telecommunications industry has a vital role to play in the education arena – join educators and telecommunications providers to discuss cutting-edge technologies serving students and teachers.

11:00 a.m. - 12:15 p.m.

- 128 Accelerated Modernization of Infrastructure and Economic Benefits** – Panel discusses the need for advanced telecom infrastructure to reach full economic potential, citing examples of government/industry cooperation to promote economic growth.
- 129 Delivering Enhanced Services to the Customer** – Industry experts outline ways to tap the new voice and data services market including electronic mail, fax on demand, database access, and interactive voice response.
- 130 Looking Ahead: Fiber in the Loop – Part II** – Future services and Next Generation Digital Loop Carrier (NGDLCs) systems – learn how they will favorably impact deployment of fiber in the loop.

2:00 - 3:15 p.m.

- 131 800 Number Portability** – The FCC recently issued an order on Docket 86-10 to accelerate the portability of 800 numbers. This session covers the attributes of 800 Data Base Service with an overview of an 800 Data Base arrangement, the service provider's perspective, and the customer's perspective.
- 132 National Network Billing Services** – Billing experts discuss issues surrounding capture and exchange of information for billing intelligent network services using the CCS/SS7 network. This includes discussion of the billing strategies and their impact on the network elements for Advanced Intelligent Network (AIN) and Switched Multimegabit Data Service (SMDS), as well as CCS.
- 133 Going Global: New International Services for Corporate Users** – Telecommunications is growing more important to international businesses. This panel reviews the new generation of international services available to users.

3:30 - 4:45 p.m.

- 134 Infrastructure Sharing – Services for Small Companies** – Learn why enactment of USTA's proposal for sharing of infrastructure among LECs will be necessary for small companies to provide customers with advanced national services.
- 135 Dial-up Videoconferencing – When Will It Be a Reality?** – Recent developments in technology, standards, and tariffs promise to make universal dial-up videoconferencing a reality. Carrier and product providers offer a status report.

3:30 - 5:15 p.m.

- 136 Automatic Message Accounting (AMA) Modernization** – To support rapid new service introduction, LECs and ICs require a modern billing system to accommodate new services in three hours. In addition, a panel will address an alternative billing media arrangement for customers who desire electronic access to their billing data.

# Thursday

Exhibits Open:  
9 a.m. – 3 p.m.

8:00 – 9:15 a.m.

- 137 Q&A for Small Telcos on Implementing Equal Access** – Many small companies only now are converting to equal access. This Q&A roundtable session provides answers and advice to attendees faced with implementing equal access. The panel consists of small companies recently converted to equal access.

9:30 - 10:45 a.m.

- 138 Perspectives on Advanced Intelligent Network** – The FCC began an inquiry into AIN deployment in the context of the open network architecture proceeding, tentatively including all Tier 1 companies. This panel examines the regulatory environment for AIN from domestic and international perspectives.
- 139 Wireless Data Communications – Taking Users Into the Future** – Users see a great need for wireless data communications – hear what is available today and what you can and cannot expect in the future.
- 140 Competitive Alternatives to the Local Loop** – Alternative local loop access is a reality. Experts identify those vehicles being used by traditional and alternative carriers to access local area users.

11:00 a.m. - 12:15 p.m.

- 141 Where the Rubber Meets the Road: Successful National ISDN Deployment** – A look at the operational and marketing potholes the industry must resolve to pave the way for widespread deployment of services based on National ISDN.
- 142 Solving the Voice Processing Puzzle – A Solution for Today's Telecom Professional** – With broad choices available for enhanced voice services, how do you sort out the features to best serve your needs? Telecom directors provide their perspective on the features to look for with ideas for future voice messaging requirements.
- 143 Preventing Network Outages** – Recent experience with network interruptions and regulatory reactions requires that communications service providers utilize every possible resource to ensure network reliability and to develop new methods of recovery.

*Please Note: Schedule Subject to Change*



# Monday

No SUPERCOMM '92 Exhibits

# Tuesday

SUPERCOMM '92 Exhibits Open:

9 a.m. - 5 p.m.

Special Sessions	8:00 - 9:00 a.m. Plenary Session	8:00 - 9:00 a.m. Joint Plenary Session/Keynote Address
<b>200</b> Level For Everyone	9:30 a.m. - 12:15 p.m. <b>201</b> ISDN Services <b>202</b> FTTH - Network Migration Strategies 11:00 a.m. - 12:15 p.m. <b>203</b> Quality Issues in Network Operations and Management 2:00 - 3:15 p.m. <b>204</b> Key Issues for FITL Systems 3:30 - 4:45 p.m. <b>205</b> Near-Term IN Services 2:00 - 4:45 p.m. <b>206</b> ISDN Update	9:30 - 10:45 a.m. <b>207</b> Network Update: The Digital Transition <b>208</b> Technology Management 11:00 a.m. - 12:15 p.m. <b>209</b> SONET - Impact on the Network <b>210</b> Radio Access 2:00 - 3:15 p.m. <b>211</b> New Network Applications <b>212</b> PCS Networking Evolution 3:30 - 4:45 p.m. <b>213</b> Private Digital Radio Networks <b>214</b> Advances in DLC Systems
	9:00 a.m. - 12 noon <b>301</b> Performance Analysis of Data Comm. Protocols <b>302</b> Topics in Wireless Communications <b>303</b> Voice Technology Advances - Public/Private <b>304</b> Combining Radio and Fiber <b>305</b> Signal Processing for Digital Storage Systems <b>306</b> Packet Switching <b>307</b> Self-Healing Networks and Integrated Network Management <b>308</b> Management of High-Speed LAN/WAN Interconnect Networks <b>309</b> Personalized TV <b>310</b> CDMA for Personal & Mobile Communications (half session) 2:00 - 5:00 p.m. <b>311</b> ATM Switching and Broadband Networking <b>312</b> Digital Cellular and Microcellular Systems <b>313</b> Application of Signal Processing in Coding <b>314</b> Communications Satellite Technologies <b>315</b> Queueing Performance of Data Networks <b>316</b> Network Survivability Performance <b>317</b> Specification Descrip. Technologies for Communications Software <b>318</b> Quality Management for Customer Satisfaction <b>319</b> Radio Design Techniques and Algorithms for PCs <b>320</b> Queueing Models for Data A Communication Networks <b>320</b> Advances in Video and Image Compression B Techniques	9:00 a.m. - 12 noon <b>321</b> Emerging IN: Transition & Implementation Issues <b>322</b> Impact of Multimedia Services on Protocols <b>323</b> Modulation and Coding I <b>324</b> Performance Enhancement Tech. in PCS Radio <b>325</b> Dimensioning/Control of ATM Networks I <b>326</b> High-Speed Optical Transmission Technology <b>327</b> Global Information Networking <b>328</b> Land Mobile Satellite Communication Techniques <b>329</b> Adaptive Filtering in Pulse Shaping & ISDN 2:00 - 5:00 p.m. <b>330</b> Photonic Switching and Interconnects <b>331</b> PCN Radio Systems Engineering <b>332</b> Progress in Broadband Switching Systems <b>333</b> Modulation and Coding II <b>334</b> High-Speed Protocols <b>335</b> Dimensioning/Control of ATM Networks II A <b>335</b> Network Control and Service Management B in ATM Networks <b>336</b> Issues in Wireless Communication Networks <b>337</b> Propagation Effects in Satellite Communications A <b>337</b> Multimedia Communications for Cooperative B Applications <b>338</b> High-Speed MANs <b>339</b> Customer Evaluations
<b>400</b> Level ICC Tutorials And Workshops*	9:00 a.m. - 5:00 p.m. <b>401</b> Broadband Networking Tutorial #1 9:00 a.m. - 12 noon <b>404</b> Telecommunications Management Network: Tutorial #5 Principles, Models and Applications 2:00 - 5:00 p.m. <b>405</b> Signalling System Number 7 for Fixed Tutorial #6 and Mobile Networks	9:00 a.m. - 5:00 p.m. <b>402</b> Broadband Services and Industrial Tutorial #2 Applications 9:00 a.m. - 12:30 p.m. <b>407</b> Network Synchronization Workshop #1 2:00 - 5:00 p.m. <b>408</b> Technology Management: A Shifting Workshop #2 Paradigm
	12:15 - 1:45 p.m. <b>Awards Luncheon</b>	6:00 p.m. <b>Conference Reception and Banquet</b>
	* For technically-oriented professionals seeking an overview. Register early - space is limited.	



# Wednesday

*SUPERCOMM '92 Exhibits Open:*

*9 a.m. – 5 p.m.*

*8:00 - 9:15 a.m.*

**General Session by SUPERCOMM '92**

*9:30 - 10:45 a.m.*

**215 Expert Systems in Telecom: Real-World Experiences**

*9:30 a.m. - 12:15 p.m.*

**216 Significant Telecom Technology Standards**

*11:00 a.m. - 12:15 p.m.*

**217 Broadband ATM/STM Network Services Opportunities**

*2:00 - 3:15 p.m.*

**218 Arch. Considerations for Enhanced Serv. Platforms**

**219 Broadband Nets & Systems: Experiments/Trials**

*3:30 - 4:45 p.m.*

**220 Capturing Cellular Data Markets**

**221 Mass Market Telecom Services**

*9:30 a.m. - 12:30 p.m.*

**340 Photonic Networks I**

**341 Congestion Control & Routing  
in High-Speed Networks**

**342 Wireless Local Area Networks**

**343 Neural Network Techniques: Adaptive Filtering**

**344 Analysis & Design: Communications Systems**

**345 Mobile Communication Networks**

**345 Packet Radio Networks**

**346 Coding for Digital Storage Systems**

**347 Advanced Technologies in Management of  
Transport Networks**

**348 Advances in Data Communications**

*2:00 - 5:00 p.m.*

**349 Photonic Networks II**

**350 Advanced Techniques for Terrestrial  
Digital Radio**

**351 Adaptive Equalization of Time Dispersive  
Channels**

**352 AI Applications in Telecommunications**

**353 Digital Signal Processing for Satellite and  
Space Communications**

**354 Advances in ATM Switching**

**355 Global Quest for Quality Products and Services**

**356 PCSs and Their Implementation**

*9:30 a.m. - 5:00 p.m.*

**403 Spread Spectrum Systems: Techniques  
and Applications**

**406 Satellite ISDN: Architectures, Technology  
and Applications**

# Thursday

*SUPERCOMM '92 Exhibits Open:*

*9 a.m. – 3 p.m.*

*8:00 a.m. - 12:15 p.m.*

**SUPERCOMM '92 Seminars**

**ICC Feature Sessions: (Free of Charge)**

**#318: Quality Management for Customer Satisfaction**

Monday, 2:00 - 5:00 p.m.

**#327: Global Information Networking**

Tuesday, 9:00 a.m. - 12 noon

## SUPERCOMM '92 Exhibition

SUPERCOMM '92 is featuring 450 exhibitors displaying thousands of innovative products and services. Products you'll need to build the flexible and powerful systems of tomorrow. Services you'll need to build, maintain, and strengthen support. Just look at the sample listing of products you can see:

Accessories • Accounting Services and Systems • Alarm Reporting Systems • Antennas • Automatic Call Distributors • Batteries-Storage/Chargers/Test Equipment • Booths-Telephone • Building Cable Systems/Storage • Cable-Plows and Reel Trailers/Pressurizing Equipment/ TV Equipment and Systems • Call Accounting • Carrier Equipment • Cases/Custom Built • Cellular/Mobile/ Paging Systems • Centrex Systems Products • Communications Equipment • Construction Equipment and Supplies • Cords-Switchboards/ Telephone Sets • Data Communications Equipment and Systems • Data/Electronic Matrix Switches • Data Terminals • Diagnostic Monitoring Systems • Ducts • Electronic Mail • Engineering Services • Facsimile (FAX) • Fiber Optic Communications Equipment and Systems • Integrated Voice/ Data Terminals • Interconnect Equipment and Services • ISDN Products • Key Systems • Ladders • Loading Coils • Local Area Networks (LANs) • Locators • Maintenance Equipment • Metropolitan Area Networks (MANs) • Microwave Communications Equipment and Systems • Mobile Power Units • Mobile Radio Telephones • Modems • Motor Truck Bodies • Multiplexers • Office Machines and Equipment • Operational Support Systems • Outside Plant Equipment • Packet Systems • Patching and Switching Equipment • Pay Telephones and Peripherals • Pole Line Equipment • Power Supply Equipment • Printers-Computer • Private Branch Exchanges (PBXs) • Protection Equipment • Protocol Converters • Radio Communications Equipment and Systems • Rate Services • Ringing Equipment • Satellite Communications Equipment and Systems • Security Equipment • Service Bureaus • Signs/Identification Systems • Software • T1 • Telecom Management Aids • Telecommunications Equipment Distributors • Teleconferencing-Audio/ Video • Telephone Apparatus/Auto-Answer Equipment and Systems • Telephone Equipment and Systems-New/Remanufactured • Telephone Management Systems and Software • Telephone Marketing Systems • Telephone Supplies • Telephone Switching Equipment • Telex • Terminals • Test Equipment • Time Announcement Equipment • Transmission Equipment • Voice Equipment/ Voice Mail • Wide Area Networks (WANs) • Wire/Wire and Cable • X.25 Products



## **Gigabit Networking Workshop For Private Network Administrators**

**S**ign up today for this two-day workshop dealing with ultra high-speed data and communications applications for large network users on Tuesday and Wednesday, June 16 and 17. Fiber optic networks have opened up the practicality of ultra high-speed transport facilities. Research and development is under way to extend this capability into practical networks that will operate at speeds of a gigabit (one billion bits) per second or higher.

The resulting ultra high-speed digital networks will enable many new and exciting applications in medical, education, military, financial, research and development, and other communities. Many challenges, technical and otherwise, face planners in developing practical networks to exploit the potential business opportunities.

SUPERCOMM's co-sponsors, the United States Telephone Association and the Telecommunications Industry Association, are joining with the prestigious IEEE Communications Society to provide this special workshop. It will focus on enabling applications, extending computer room solutions to enterprise networks, architectural implications of applications, and organizational shifts and economics of gigabit networks.

The event will be structured with presentations and discussion taking place from 8:30 a.m. to 2:00 p.m. Tuesday and Wednesday, including lunch. As part of the registration fee you may attend (free) afternoon exhibits, which will stress ultra high-speed networks and specific applications at the co-located SUPERCOMM '92, or attend a wide variety of technical sessions offered Monday through Wednesday at ICC '92. You may also participate in any of the 43 SUPERCOMM seminars Monday through Thursday, as part of your gigabit workshop registration.

### **Gigabit Workshop Goals**

- identify key applications and opportunities offered by ultra high-speed networks,
- discuss the impact and economics of these applications on network and computer architectures, and
- identify likely directions for architectures and business opportunities.

### **Gigabit Networking: Who Needs It? Applications and Business Impacts**

#### **Mini-Theme I – System Applications and Experiences**

Views by users, equipment vendors, and service providers reporting on applications based on extensions of today's computer room solutions. They will discuss enabling applications and technologies that are making paradigm shifts possible in the global enterprise network.

*Tuesday 8:30 a.m. – 9:00 a.m.*

#### **So Who Needs a Gigabit Network Anyway?**

Theme Speaker – TBA

#### **Session 1**

*Tuesday 9:00 a.m. – 10:30 a.m.,  
McMahon Room, McCormick Place  
East, Upper Level*

#### **Extending Computer Room Solutions to Enterprise Net- works**

The emergence of powerful desk-top workstations, together with distributed computing and multimedia information, will stimulate the establishment of enterprise-wide gigabit networks. The speakers will share their experience and forecast trends.

*Organizers: Nim Cheung, Executive  
Director – Transwitching Research,  
Bellcore; Tom Browne, Executive  
Director – Corporate Telecommunica-  
tions, Bellcore*

## **Technical Program**

*Chairperson: Jonathan Turner, Pro-  
fessor of Computer Science, Wash-  
ington University*

**1a Creative Applications  
of Large Bandwidth in Enter-  
prise Networks** – Martin  
Nisenholtz, *Senior Vice President,  
Ogilvy and Mather*

**1b Decentralizing and Re-  
engineering Work Functions**  
– Dan Schutzer, *Vice President –  
Advanced Technology, Citicorp*

**1c Applications of New  
Electronic Imaging Tech-  
nologies in Enterprise Net-  
works** – Bob Sanderson, *Director  
of Research, Eastman Kodak*

**1d The Role of High Capac-  
ity Networks in Manufactur-  
ing** – Kevin Conlin, *Consultant*

### **Panel Discussion on Above**

*Tuesday 10:30 a.m.*

#### **Coffee**

#### **Session 2**

*Tuesday 10:50 a.m. – 12:20 p.m.,  
McMahon Room, McCormick Place  
East*

#### **Paradigm Shifts – Enabling Applications**

The session focuses on various applications that are being developed and considered to create exciting and thought-provoking paradigm shifts worldwide. Covered will be applications that will benefit from gigabit networks, major changes in lifestyle envisioned, and impact on business order throughout the world.

*Organizer: Tom Appleby, Manager –  
Network Strategic Planning, Bell-  
South Telecommunications  
Chairperson: Scott Esty, Manager –  
New Market Development, Corning*

**2a Enterprise Medical  
Applications** – Anthony Gorry,  
*Vice President – Information Tech-  
nology, Baylor College of Medicine*



**2b Network Access to Education Resources** – Warren Gifford, *Executive Director – Broadband Services Research, Bellcore*

**2c Supercomputers – Will Gigabit Networks Allow Useful Applications?** Speaker – TBA

**2d Strategic Advantage – The Global Enterprise Network** – Lawrence Vanston, *Partner, Technology Futures, Inc.*

#### Panel Discussion on Above

Tuesday 12:30 p.m. – Chicago Room, McCormick Place East, Upper Level  
**Lunch**

Luncheon Speaker I – 1:30 p.m.  
**Networking Needs for Large Private Enterprise Networks**  
Speaker – TBA

Tuesday 2:00 p.m. – 5:00 p.m., McCormick Place North and East  
**Exhibits and Sessions**  
View applications from various vendors on broadband solutions that are available today or attend related SUPERCOMM/ICC '92 sessions.

#### Mini-Theme II – Economics, Benefits and Organizational Impacts

Views by users, equipment vendors, and service providers reporting on enablers, organizational shifts, architectural implications, economics and roadmap on "How to Get There from Here."

Wednesday 8:30 a.m. – 9:00 a.m.  
**Can We Get There à la "ARPA NET"?**  
Theme Speaker – William Burr, *Engineer, NIST*

#### Session 3

Wednesday 9:00 a.m. – 10:30 a.m., McMahon Room, McCormick Place East

#### Enablers, Organizational Shifts and Economics of Gigabit Networks

The availability of gigabit networks and their use for high performance

applications will have a number of impacts on the way in which business is conducted, including economic and regulatory. This session examines the issues and effects of this technology on the organization, society, and user.

*Organizer: James Sterbenz, Advisory Engineer/Scientist – High Performance Computing and Communications, IBM*  
*Chairperson: Ira Richer, Consulting Engineer, The MITRE Corporation*

**3a Need for a New Software Platform Enabling Multi-media Network Services** – David Nagel, *Senior Vice President – Technology, Apple Computer*

**3b Interactive Multimedia Information Delivery** – Sanjaya Addanki, *Senior Technical Consultant, IBM Research*

**3c Impact of Multimedia Applications on Traditional Telecommunication Regulation and Tariffs** – Stu Personick, *Assistant Vice President – Information Networking Research, Bellcore*

**3d Changes in the Communications Environment – Private Networking and New Services by Carriers** – Hanafy Meleis, *Technical Director – Corporate Backbone Networks, DEC*

#### Panel Discussion on Above

Wednesday 10:30 a.m.  
**Coffee**

#### Session 4

Wednesday 10:50 a.m. – 12:20 p.m., McMahon Room, McCormick Place East

#### Architectural Implications – "How to Get There from Here"

This session addresses the implications of ultra-broadband distributed applications on the major network elements. The speakers will also consider how and when migration to future gigabit networks will occur.

*Organizer: Ned Farinholt, Executive Staff – Advanced Systems, MCI*  
*Chairperson: Ed Jungerman, Chief*

*Executive Officer, Impulse Telecommunications*

**4a Is Access a Problem?** – Dan Kelley, *Senior Vice President, Hatfield Associates*

**4b A Carrier's Perspective – Circuits, Cells, and SONET** – David McDysan, *Executive Staff – Network Systems, MCI*

**4c The Workstation Provider's View – Bandwidth vs. Processing** – Geoffrey Baehr, *Director for Networking and Data Communications, Sun Microsystems*

**4d The User's Viewpoint – Moving Large Files Fast** – John Sandberg, *Director – Network Design, COMDISCO Disaster Recovery Service*

#### Panel Discussion on Above

Wednesday 12:30 p.m. – Chicago Room, McCormick Place East  
**Lunch**

Luncheon Speaker II – 1:30 p.m.  
**Government Policy/Industry Stimulation**  
Speaker – Eugene Wong, *Associate Director for Industrial Technology, Office of Science and Technology Policy, White House*

Wednesday 2:00 p.m. – 5:00 p.m., McCormick Place North and East  
**Exhibits and Sessions**  
View applications from various vendors on broadband solutions that are available today or attend relevant SUPERCOMM/ICC '92 sessions.

#### Registration

The gigabit workshop registration fee is \$295 (U.S. funds) or \$395 after May 25. For logistical reasons, attendance will be limited to 350 participants on a first-come, first-served basis, so please act promptly. Pre-register using the form on last page, Line I. For additional information, call the workshop registrar/treasurer at the IEEE Communications Society, Phone (212) 705-7018 or Fax (212) 705-7865.



Our success in tomorrow's global economy will depend upon our ability to educate our young people effectively today. Communications technologies will play a critical role in teaching, training and guiding the world's future citizens and leaders.

At SUPERCOMM/ICC '92, Ameritech, Ameritech Bell companies and other technology providers will present Ameritech SuperSchool, a hands-on centerpiece display that will

allow its visitors to experience the benefits telecommunications can bring to education.

SuperSchool will demonstrate applications based on current technologies that show how knowledge and education can be easily and effectively delivered and administered to virtually everyone — in the classroom or library, at home or at the office.

SuperSchool will show applications like distance

learning, networking of audiovisual and computer-aided teaching tools, and ways students and instructors can access a world of multimedia educational information.

These are only a few of the many fascinating applications you'll find in SuperSchool. Make it a must-see on your agenda at SUPERCOMM/ICC '92, McCormick Place in Chicago, June 16-18. Admission is free to registered show attendees.

Ameritech SuperSchool — showing America's educators, business leaders and government officials how to unlock the future of education.

**Ameritech  
SuperSchool**



# Unlocking The Future.





**SUPERCOMM Celebrates Success**

Interested in exhibiting in Chicago? There may still be space at SUPERCOMM '92. Contact Ben Stauffer at our contractor – E.J. Krause & Associates, 7315 Wisconsin Avenue, Suite 420 East, Bethesda, MD, USA, 20814. Phone (301) 986-7800, fax (301) 986-4538, or Telex 4944944 EJK EXPO.

**Future Dates to Plan For:**

Also be aware that space even now is being spoken for at SUPERCOMM '93. Building on five years of enormous success, we're already

scheduled through 2000, but here are the next few important dates:

'93 Atlanta (with Telocator)	April 19-22
'94 New Orleans (with ICC)	May 2-5
'95 Anaheim	March 20-23

**Help Us Help You**

We want to make your comfort our priority. But we need your help. Please write in the SUPERCOMM '92 and ICC '92 session numbers or other events you plan to attend, so we can make the best use of the available meeting space. Return to Henry Wieland, Executive Director – Special Events, USTA, 900 19th Street, NW, Suite 800, Washington, D.C. USA 20006-2190. Fax: (202) 835-3248. Thank you!

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**Housing and Registration Information**

Rogal America is handling all housing arrangements. Its booth will be located in the Registration Area of McCormick Place. All housing questions should be directed to Rogal.

**Hotel Confirmations/Changes**

Hotel reservation acknowledgements will be sent directly to you from Rogal. Any hotel changes or cancellations must be made directly through Rogal. Do not call the hotels directly. Hotel changes or cancellations can be made by mail, or fax 617/965-2729, Telex 413053 ROGALAM, or call 617/965-8000 or 1-800-553-0505.

**Hotel Deposits**

A hotel deposit is required for each hotel room/suite requested. The deposit must be submitted with the Official Housing/Registration Form. Forms are date-stamped and processed on a first-come, first-serve basis. All rooms must have a deposit in the amount of one night's lodging. The deposit may be in the form of a major credit card or a check payable to "Rogal America, Inc." (The Oxford House accepts only a check or money order as deposit.)

**SUPERCOMM '92 Registration**

For SUPERCOMM '92 only, fill in the registration and housing information and mail with hotel deposit. Badges will be mailed (USA and Canadian addresses only) to all SUPERCOMM attendees, so please

provide the complete correct mailing address for each registrant. You will receive your badge approximately 2 weeks prior to the show. If you do not receive your badge, please register on site.

Foreign badges will not be mailed. Please pick up your badge at the McCormick Place registration booth.

**ICC '92 Registration**

To register for ICC '92 sessions, please fill in the ICC '92 Registration Fees section in addition to the housing/registration information. Please include a check or payment for the ICC '92 sessions. Make checks payable to ICC '92. *Important: If paying by check, separate checks for housing and registration fees must be sent. Payment in U.S. dollars only please.*

**Registration Deadlines**

The SUPERCOMM '92 deadline is May 15, 1992. After this date, registrations for SUPERCOMM will not be honored, and you will not receive your badge by mail. Please register on site. For housing, rooms will be available on a space available basis. ICC '92 registration will be accepted until one week before the conference.

**Discount Airline Information**

American Airlines is designated as the SUPERCOMM '92 and ICC '92 preferred airline. To book your airline reservations, please contact Himmel & Associates at 1-800-328-6898 and identify yourself as a

SUPERCOMM or ICC attendee. Reduced airfares are offered on most airlines serving the Chicago area. Call early to secure the lowest priced tickets. If calling from overseas, the phone number is 312-236-6470; or fax your travel request to 312-236-0377 to the Himmel Travel Department. If calling from Canada, please call toll free 1-800-621-2386. *Please support the SUPERCOMM and ICC programs by allowing the travel office at Himmel & Associates to handle your travel arrangements. By doing so you will not only help our programs, but you will be eligible to win two free roundtrip tickets for travel in the continental U.S.*

**Car Rental**

Alamo Rent-a-Car has been appointed the official car rental company for SUPERCOMM '92 and ICC '92 in Chicago, on June 14-18, 1992. Special car rental rates will be available one week before and one week after SUPERCOMM/ICC. All Alamo rentals include unlimited free mileage, with rates starting as low as \$26.00 per day and \$99.00 per week. To make reservations, call Alamo at 1-800-732-3232 and request Group I.D. #242434 and Rate Code G3. From Canada, call 1-800-327-9633; or call 305-522-0000 and ask for reservations.

Mail forms to: Rogal America, Inc.  
SUPERCOMM® '92 and ICC '92  
313 Washington Street, Suite 300  
Newton Corner, MA 02158



## Housing and Registration Information (con't.)



	Hotel	units	single	double
1	The Bismarck Hotel 171 W. Randolph Street	150	\$ 75	\$ 86
2	The Blackstone Hotel Michigan Ave. at Balbo	200	\$ 99	\$109
3	Chicago Hilton & Towers 720 S. Michigan Ave. (ICC '92 Headquarters Hotel)	1000	\$140 \$205	\$165 \$230
4	The Congress Hotel 520 S. Michigan Ave.	150	\$ 95	\$105
5	Days Inn 644 N. Lake Shore Drive	150	\$ 99	\$109
6	The Drake 140 E. Walton Place	150	\$175	\$210
7	Embassy Suites 600 N. State Street	100	\$155	\$155
8	Essex Inn 800 S. Michigan Avenue	200	\$ 92 \$106	\$102 \$112
9	Executive House 71 E. Wacker Drive	250	\$120	\$135
10	Forum Hotel 525 N. Michigan Ave.	300	\$119	\$139
11	Grant Park Hotel (Best Western) 1100 S. Michigan Ave.	150	\$ 80	
12	Guest Quarters 198 E. Delaware Place	150	\$160	\$185
13	Holiday Inn Chicago City Centre 300 E. Ohio Street	200	\$128	\$144
14	Holiday Inn Mart Plaza 350 N. Orleans Street	200	\$112	\$125
15	Hotel Intercontinental 505 N. Michigan Ave.	200	\$169	\$189
16	Hotel Nikko 320 N. Dearborn	200	\$185	\$200
17	Inn of Chicago 162 E. Ohio at Michigan Ave.	200	\$108	\$116
18	The Knickerbocker Walton Place at Michigan Ave.	100	\$155	\$177
19	The Lenox House 616 N. Rush Street	100	\$ 99	\$109
20	The Marriott 540 N. Michigan Ave.	800	\$161	\$181
21	McCormick Center Hotel Lake Shore at 23rd Street	500	\$109 \$159	\$129 \$179
22	The Oxford House 225 N. Wabash	100	\$ 85	\$ 95
23	Palmer House Hilton 17 E. Monroe Street	900	\$119	\$119
24	Ramada, Lake Shore 4900 S. Lake Shore Drive	150	\$ 79	\$ 89
25	The Richmond Hotel 162 E. Ontario Street	100	\$115	\$127
26	Sheraton Chicago 301 E. North Water Street	700	\$163 \$191	\$191 \$219
27	Sheraton Plaza 160 E. Huron	150	\$149	\$169
28	Stouffer Riviere One W. Wacker Dr.	285	\$170	\$170
29	The Tremont 100 E. Chestnut St.	50	\$149	\$159



Advance Registration/Housing Form (Whether or not you use hotel accommodations, you need to fill out this form)

Last Name \_\_\_\_\_

First Name \_\_\_\_\_

Nickname for Badge \_\_\_\_\_

Company Name \_\_\_\_\_

Street Address \_\_\_\_\_

Room #/MS/Suite \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Fax \_\_\_\_\_

Industry Affiliation \_\_\_\_\_ (Use number from #1 below)

Professional Responsibility \_\_\_\_\_ (Use letter from #2 below)

IEEE Membership Number \_\_\_\_\_

Is your company a member of ☐ USTA ☐ TIA

ET

Name of Spouse/ Guest for Badge \_\_\_\_\_

Do you require housing? ☐ YES ☐ NO

HOTEL PREFERENCE

First Choice \_\_\_\_\_

Second Choice \_\_\_\_\_

Third Choice \_\_\_\_\_

Please check how your choice was made: ☐ Rate ☐ Location

All rooms must have a guarantee in the amount of one night's lodging. You may guarantee your room with a major credit card or a check payable to Rogal America, Inc. (The Oxford House accepts only a check or money order as deposit.)

Hotel Room Type Requested (Single or Double) \_\_\_\_\_

Arrival Date \_\_\_\_\_ Departure Date \_\_\_\_\_

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Choose ONE category that best describes your Industry Affiliation. (Also enter on form above under your address.)

Exchange Carriers/Subsidiaries

10 Bell Holding Companies

11 Bell Operating Companies

12 Independent Holding Companies

13 Independent Operating Companies

14 Foreign Telcos

Non-Operating Telco Subsidiaries

15 Bell

16 Independent

Other Carriers

17 Long Oistance

18 International

19 Mobile/Cellular

20 CATV/Radio/TV

Other Telecom Providers

21 Telecom Manufacturers

22 Oealers & Distributors

23 Contractors & Electrical Services

24 Consultants & Architects

25 Financial & Leasing Companies

26 Data Communications Equipment Manufacturers

27 Data Communications Services

28 Telecommunications Associations

Telecom Users

29 Educational

30 Financial/Investment

31 Hospitals/Health Care

32 Hotel/Motel

33 Legal/Insurance/Real Estate

34 Publishing

37 Research & Development

38 Stadiums/Convention Centers

39 Trade (Wholesale/Retail)

40 Transportation/Pipelines

41 Utilities (Gas/Water/Electric)

Government

42 Government/Regulatory

43 Military

44 Foreign

Other

46 Press

50 Spouse/Child (non-industry)

51 Other

2. PROFESSIONAL RESPONSIBILITY

Choose ONE that best describes your professional responsibility. (Also enter on form above under your address.)

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B Sales/Marketing/Customer Service

C Human Resources

O Engineering

E Network Operations

F Research & Oevelopment

G Central Office

H Transmission

I Cable & Wire

J Voice/Data Management

K Mobile/Cellular Communications

L Support Services

M Fiber Optic Operations

N Other

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	Before May 25	After May 25	TOTAL	CODE	
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2 LIMITED – Includes all Sessions, Exhibits, Record	190	230	_____	2	
3 1-DAY – Includes all Sessions, Exhibits (Circle one: MON TUES WED)	145	145	_____	3	
4 LIFE MEMBER – Includes all Sessions, Exhibits	5	5	_____	4	
<b>NON-MEMBER REGISTRATION</b>					
5 FULL – Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet	\$375	\$425	_____	5	
6 LIMITED – Includes all Sessions, Exhibits, Record	290	330	_____	6	
7 1-DAY – Includes all Sessions, Exhibits (Circle one: MON TUES WED)	245	245	_____	7	
<b>OTHER</b>					
8 SERIES 200 SESSIDNS DONLY, Exhibits	\$ 70	\$ 90	\$ _____	8	
9 STUDENT – Includes all Sessions, Exhibits	5	5	_____	9	
<b>OPTIONS</b> (In addition to items included in Registration Fee above)					
A Tutorial # 1 – Broadband Networking (Monday all day)	\$135	\$155	\$ _____	A	
B Tutorial # 2 – Broadband Services and Industrial Applications (Tuesday all day)	135	155	_____	B	
C Tutorial # 3 – Spread Spectrum Systems (Wednesday all day)	135	155	_____	C	
D Tutorial # 4 – Satellite ISDN (Wednesday all day)	135	155	_____	D	
E Tutorial # 5 – Telecommunications Management Networks (Monday morning)	60	70	_____	E	
F Tutorial # 6 – Signalling System #7 for Fixed & Mobile Networks (Monday afternoon)	60	70	_____	F	
G Workshop # 1 – Network Synchronization (Tuesday morning)	60	70	_____	G	
H Workshop # 2 – Technology Management (Tuesday afternoon)	60	70	_____	H	
I Gigabit Networking Workshop (Tuesday and Wednesday)	295	395	_____	I	
K Awards Luncheon (Monday)	QTY _____	35	40	_____	K
L Conference Banquet (Tuesday)	QTY _____	50	55	_____	L
M Addl. Conference Record	QTY _____	70	85	_____	M
N Shipping Conf. Record (To listed street address – U.S. only)	QTY _____	15	15	_____	N
<b>FEATURE SESSIONS</b>					
O Quality Management for Customer Satisfaction (Monday afternoon)		(free of charge)	_____	O	
P Global Information Networking (Tuesday morning)		(free of charge)	_____	P	
<b>SOCIAL EVENTS</b>					
Q Chicago Highlights/Dceanarium (Monday morning)	QTY _____	\$ 25	\$ 30	\$ _____	Q
R Monday Night at the Museum	QTY _____	43	48	_____	R
S Highlights, Chicago's Gold Coast (Tuesday morning)	QTY _____	24	29	_____	S
T Cooking Demonstration (Tuesday afternoon)	QTY _____	(free of charge)	_____	T	
U Art Institute/Shopping (Wednesday morning)	QTY _____	23	28	_____	U
<b>TOTAL REMITTANCE</b> \$ _____					
Must be in U.S. Dollars (No refunds for cancellations after May 25, 1992)					

METHOD OF PAYMENT (Registration and Hotel)

☐ Check (must use separate checks for ICC '92 registration and hotel deposit)

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Credit Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_





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### A Special Thanks!

... to *Telephony Magazine* and *Network World*—official publishers for SUPERCOMM®'92.

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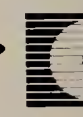
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# INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

## Worth Noting

“**B**ridging technology has its rightful place in the local arena but is ill-suited for wide-area internetworking.”

**Craig Fulgham**  
Network engineer  
Fujitsu America, Inc.  
San Jose, Calif.

## Link Notes

**Xyplex, Inc.** is planning to announce at INTEROP 92 Spring two local routers that provide a packet forwarding rate of up to 6,000 packet/sec.

The new 3210 and 3710 Local Routers will support the Transmission Control Protocol/Internet Protocol as well as Novell, Inc.'s Internetwork Packet Exchange (IPX) protocol.

Routing support for Digital Equipment Corp.'s DECnet IV and Apple Computer, Inc.'s AppleTalk will be available later this year.

The 3210 is a stand-alone unit with two 15-pin attachment unit interfaces (AUI) for connecting to Ethernet local-area networks.

The 3710 is a router module for Xyplex's 4550 intelligent hub chassis, with one 15-pin AUI and a second interface to the internal bus of the chassis.

Both routers are fully compliant with the Simple Network Management Protocol standards, enabling them to be managed remotely via Xyplex's ControlPoint network management software or any other third-party SNMP-based management system.

The 3210 stand-alone router will cost \$3,695, while the 3710 router card will be priced at \$2,995. Both will be available at the end of the month. **■**

## Bytex tool heads network disruptions off at the pass

Pack detects problems before they wreak havoc.

**By Maureen Molloy**  
Senior Writer

**WESTBOROUGH, Mass.** — Bytex Corp. last week announced fault-prevention software for its Series 7700 Intelligent Switching System Hubs that prevents disruptions on token-ring local-area networks by stemming potential net errors before they occur.

The new Beacon Guard software lets hub ports detect and deny attempted token-ring entry to any device connected to a port that does not run the port's software-defined speed of 4M or 16M bit/sec.

Beaconing is a token-ring error notification and recovery system that enables a station to send a message when it detects an error or failure on the network.

For example, on a 4M bit/sec token ring, if a workstation attempts to send data at 16M bit/sec, the adapter card could beacon after detecting the error situation, and a ring crash could result.

Beacon Guard will not allow

traffic from the device to reach the ring and will send an alert to the user's net management station.

It handles conditions that typically cause beaconing, such as stuck relays and severed trunk cables.

Also new with the Series 7700 line is Monitor 1.0, a board that provides beacon detection and reports beacon conditions and fault domain information that helps users target the location of malfunctioning devices.

The Monitor 1.0 board is not required for use with Beacon Guard. Instead, it is used for problems that cannot be detected before causing a network disruption, such as a disabled external repeater.

Each monitor board can connect to one token ring at a time but may be switched via software to monitor many token rings.

Beacon Guard is included for free with all Series 7700 token-ring port modules. The Monitor Board costs \$2,995 per board. **■**

## Chipcom to offer fiber E-net links

**By Joanne Cummings**  
Senior Writer

**SOUTHBOROUGH, Mass.** — Chipcom Corp. has unveiled a module and transceiver that lets users link Ethernet stations or hubs to its ONline System Concentrator via fiber-optic cable.

The new module and transceiver are Chipcom's first products based on the IEEE Fiber Optic Inter-Repeater Link (FOIRL) standard, according to Pam Saussy, product manager at Chipcom. FOIRL specifies an asynchronous, repeater-based approach for running Ethernet over fiber, she said.

The FOIRL module has four fiber-optic ports and occupies one slot in either a six- or 17-slot ONline hub.

Like Chipcom's other modules, it can be assigned dynamically to any of three Ethernet net-

works on the hub's TriChannel backplane via software. It also incorporates hardware-based logic that enables it to automatically switch to a user-designated backup port on the module should the primary link fail.

The new module complies with the IEEE FOIRL standard but enables desktop connections to be as far as two kilometers away from the hub, doubling the distance specified in the standard. That is intended to ensure compatibility with the emerging 10Base-FL standard that addresses Ethernet-over-fiber desktop connections, Saussy said.

In addition to the module, Chipcom unveiled an FOIRL transceiver. The single-port FOIRL transceiver, which is fully compatible with the emerging 10Base-FL standard, uses multi-mode fiber to link a network station to an Ethernet local-area network. The ONline Ethernet FOIRL Module, the Model 5104M-FL, is scheduled to be available in June and is priced at \$1,800. The ONline Ethernet FOIRL Transceiver, the Model 5101T-FL, is currently available and is priced at \$495. **■**

## Hub feature forecast

Feature	3Com Corp.	Ungermann-Bass, Inc.
Asynchronous Transfer Mode support	Planned	1993
Dedicated bandwidth to the desktop	Current	Planned for this year
Bridge/router support	Multiport RISC-based bridge/routers planned for this year	RISC-based bridge/routers planned for this year
Network management features	Moving to full SNMP support; will add Fiber Optic Inter-Repeater Link support, token-ring Management Information Bases, gateways to IBM NetView	Move to distributed management through new Adaptive Internetwork Management technology
Security	Current for Ethernet	Announced for Ethernet
Per-port switching	Planned	Planned
Long-term direction	SDLC concentrator, support for high-speed desktop LANs	Support for wireless LANs, portable PCs, Extended ISA, ISA and VMEbus-based cards

ISA = Industry Standard Architecture  
RISC = Reduced Instruction Set Computing

NETWORK WORLD

## Hub vendors ready transition to ATM

Ungermann-Bass employs three-pronged strategy, while 3Com plans to expand LinkBuilder family.

*First of a two-part series. The second part will examine the strategies of SynOptics Communications, Inc. and Cabletron Systems, Inc.*

**By Joanne Cummings**  
Senior Writer

Vendors of local-area network hubs are readying a host of new features for delivery over the next few years that include everything from support for Asynchronous Transfer Mode (ATM) to the ability to run applications.

Most hub makers plan to support ATM in the 1993-1994 time frame, and some of the product features they will add between now and then are intended to better position hubs for the advent of the high-speed switching technology. Other capabilities will simplify integration of hub-based LANs into enterprise internets.

Part 1 of this two-part series examines the plans of Ungermann-Bass, Inc. and 3Com Corp., while Part 2 next week will look at SynOptics and Cabletron.

Ungermann-Bass has a three-pronged strategy that is intended to lead the vendor to ATM support next year. The strategy calls for exploiting the capabilities of the PlusBus in Ungermann-Bass'

Access/One hub.

According to Steve Diamond, group director of corporate marketing at Ungermann-Bass, the PlusBus uses a message-switching architecture optimized for Reduced Instruction Set Computing (RISC)-based hub modules and offers 300K packet/sec of aggregate forwarding capacity. "The PlusBus, although it is not a cell relay switch, is our first step toward a switch-based architecture," Diamond said.


Ungermann-Bass plans to offer a RISC-based module, called Data Link Pipes, that will enable users to dedicate a full 10M bit/sec of bandwidth to each user on the LAN. "We will be stretching the PlusBus switching fabric down to the individual workstation and providing dedicated bandwidth to each user," Diamond explained.

With today's hub-based LANs, each node contends for the same 10M bit/sec of bandwidth. With dedicated bandwidth, all users will have a full 10M bit/sec at their disposal, making it possible to support more bandwidth-intensive applications.

Next, Ungermann-Bass will expand on the RISC-based

(continued on page 18)





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## Hub vendors ready transition to ATM

*continued from page 15*

bridges and routers it offers for the hub. The company has already announced RISC-based Fiber Distributed Data Interface-to-FDDI and FDDI-to-Ethernet bridges. The products use dual Intel Corp. i960 RISC processors — one to handle the interface with the PlusBus and the other to act as a processing engine — to enhance performance.

Diamond said Ungermann-Bass will fol-

low up the FDDI products with a family of cards for Ethernet, token-ring and wide-area connectivity. The company also plans to support Systems Network Architecture routing now that IBM has licensed its Advanced Peer-to-Peer Networking (APPN) network node specifications.

The third part of the strategy is something Ungermann-Bass calls Open Managed Applications. The company will provide RISC-based cards that plug into the PlusBus and, in turn, support components built to industry-standard buses such as Industry Standard Architecture (ISA), Ex-

tended ISA and VME. This will enable users to add devices such as X.25 or 3270 gateways, print servers and fax servers.

"We want to support off-the-shelf applications inside the secure, managed environment of the smart hub," Diamond explained. He said this functionality should be available by year end.

By 1993, Ungermann-Bass will likely begin offering its first ATM products, according to Diamond. "We intend to support ATM side by side with our Ethernet, token-ring, FDDI and other services," he said.

The initial ATM products will include an ATM switch on a card that will reside within Access/One hubs and provide desktop ATM connectivity to support work groups of multimedia workstations over twisted-pair wiring at speeds up to 150M bit/sec.

Ungermann-Bass will then add ATM adapter cards for the workstations and, finally, an ATM-to-PlusBus gateway that will enable the Access/One to connect with ATM switches.

### The 3Com plan

3Com is also planning to move steadily toward ATM over the next year or so and add a variety of other new features to its hub line.

According to 3Com President Eric Benhamou, the company already offers a feature similar to Ungermann-Bass' promised Data Link Pipes feature on its top-of-the-line LinkBuilder 3GH hub.

The feature, called Personal Desktop LANs, makes it possible to dedicate 10M bit/sec links to each Ethernet user. 3Com plans to broaden the offering to include dedicated 16M bit/sec bandwidth for its token-ring line.

In addition, the company plans to expand the LinkBuilder 3GH by adding a higher performance backplane on the order of gigabits per second. This backplane will provide the foundation for 3Com's eventual support of ATM technology, but Benhamou declined to say how or when the new backplane or the ATM support would be incorporated.

3Com intends to offer RISC-based multiprotocol bridge/routers for the LinkBuilder 3GH that will be based on the company's NetBuilder II bridge/router.

Like the stand-alone NetBuilder II, the hub-based device will be based on Advanced Micro Devices, Inc.'s AMD 29000 RISC processor, route as many as 10 protocols and be capable of sending thousands of packets per second, Benhamou said. The bridge/router will be available by year end.

3Com also plans to add Fiber Optic Inter-Repeater Link support to the hub, which would make it possible to link hubs using fiber. Currently, the hub requires an external box to make that connection.

3Com plans to enhance its LinkBuilder ECS second-generation hub, the middle tier of its hub line, primarily by adding support for a Synchronous Data Link Control-based concentrator. This would enable users to concentrate traffic from multiple cluster controllers and route or bridge the traffic over a wide-area network using the NetBuilder II.

As part of this strategy, 3Com plans to add token-ring support to the LinkBuilder ECS. This is all part of the company's plan to support SNA routing by licensing IBM's APPN specification ("3Com lays plan to weave SNA data in internetworks," *NW*, March 16).

For network management, 3Com plans to enhance its hubs to support full Simple Network Management Protocol capabilities as well as provide hub management applications that run on top of SunConnect's SunNet Manager. 3Com does not fully support SNMP on its hubs today.

The company also plans to support a bidirectional link to IBM's NetView net management system. That should take place in the 1992-93 time frame. ■

Companies all across the country have conquered their fear of outsourcing and learned the truth—outsourcing saves time and money. "We anticipated network growth, so flexibility was important," said Demo Tsagarakis, MIS Director for Alpha Corporation. "Cost effectiveness in outsourcing our data network included not only data transmission costs but reducing our staff time in

monitoring and managing the network." Companies have also discovered that the change to outsourcing isn't as much trouble as they thought: "Making the switch from AT&T to Cylix was no more disruptive to our operations than installing a fax line," said Robert Smith, IS director for Electrical Insulation Suppliers. And smaller companies have learned

# The Talk About Outsourcing.

that outsourcing isn't just for the big guys: "At first we didn't feel we were large enough to consider outsourcing. However, selectively outsourcing our data network provides for more time to concentrate on our applications," said Harold Atkins, corporate secretary of Churchill Truck Lines. When you outsource with Cylix, we manage your data network for you. We order,

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# GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

## Worth Noting

Participants in the two-year New York state ISDN trial have submitted a report saying they have successfully demonstrated multivendor, multicarrier ISDN. AT&T, MCI Communications Corp. and New York Telephone Co. were among the participants.

## Carriers to fall short of FCC's 800-number requirements

Waiver requests showing percentage of calls that will exceed the FCC's standard requiring, by March 1993, 97% of 800-number traffic to be portable and calls delivered with no more than 5 seconds of delay.

Carriers	Percentage of calls that will not comply with 5-second requirement	Percentage of calls that will take longer than 6 seconds to complete
Ameritech	10%	3%
Bell Atlantic Corp.	12%	3%
BellSouth Corp.	4%	NA
Nynex Corp.	5%	2%
Pacific Telesis Group	9%	None
Southwestern Bell Corp.	28%	5%
US West, Inc.	36%	9%
GTE Telephone Co.	7%	3%
Sprint Corp.	7%	NA

NA = Not available

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: INTERNATIONAL COMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

## COS, Bellcore striving to make TRIP a net of dreams

Participants to pool information, visit user sites.

By Bob Wallace  
Senior Editor

WASHINGTON, D.C. — If they build it, users will come.

That is what the Corporation for Open Systems International (COS) and Bell Communications Research are hoping for as they build a transcontinental Integrated Services Digital Network-based net designed to demonstrate interoperability among ISDN equipment and services.

The Transcontinental ISDN Project (TRIP) '92 is intended to show users that ISDN offerings

chairman of the TRIP '92 organizing committee and Bellcore's assistant vice-president of network access technology. "We envision the network being used into the future" to support the ISDN applications.

### Users join forces

In a concerted effort to boost interest in the technology, 80 users involved in the project have agreed to let other users visit their sites to view production applications of ISDN in action, he said.

Bellcore asked participants to create a profile that explains their ISDN applications and lists the equipment and services used. The profiles will be compiled in an ISDN atlas and cross-referenced by user location, application type, primary vendor and switch manufacturer.

The atlas will include a contact person at each participating firm.

"Most users have no idea what ISDN applications are out there today and how they've been implemented," said Jim Jacobson, cochairman of the TRIP '92 organizing committee and supervisor of institutional telecommunications and office automation for Jet Propulsion Laboratories, one of the user participants. "That's what we'll exhibit, document and discuss."

TRIP '92 calls for carriers in the U.S. and Canada to equip cer-

(continued on page 27)

**"Most users have no idea what ISDN applications are out there today."**

▲▲▲

from multiple suppliers can interoperate using National ISDN 1, an emerging ISDN specification. The TRIP network is scheduled to be cut over Nov. 16 as part of the User's Open Systems Conference here.

"What we're trying to do with TRIP is establish a single, multi-vendor ISDN network that can be used to support basic ISDN applications," said Richard Aloia, co-

## Users try to thwart 800-portability delay

With LECs asking FCC for more time, users mount a campaign favoring the March '93 deadline.

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — In a series of almost weekly filings last month, users mounted a last-ditch effort to keep the Federal Communications Commission from giving in to local carrier requests to delay 800-number portability.

Last August, after months of negotiations among users, regulators and carriers, the FCC ordered the major local carriers to install the necessary technology to make 800 numbers portable by March 1993. The FCC also laid out network performance requirements for such parameters as access time.

However, every carrier covered by that order — the seven regional Bell holding companies and GTE Telephone Co. — has since come back to the FCC claiming it overestimated its ability to

hit the March '93 date and asked for waivers from the deadline and performance requirements.

"The delicate balance struck by the commission [between carriers and users] could be seriously jeopardized by substantial relaxation of 800 database access-time standards or significant slippage in targeted cutover dates," said the Ad Hoc Telecommunications Users Committee.

Portable 800 numbers will open a new world of greatly increased competition and user choices. The technology, for example, will let customers use the same 800 number and change carriers during various times of the day to get the best rates or to accommodate time zones or peak loads at certain offices.

Currently, 800 numbers are assigned to specific long-distance carriers, which means customers

(continued on page 27)

## Device helps prevent toll call fraud

By Bob Wallace  
Senior Editor

IRVINE, Calif. — Western Telematic, Inc. has introduced a device that is designed to help detect unauthorized calls and alert network managers.

Pollcat II+ is a call accounting recorder that can be attached to most major private branch exchanges and configured to notify users when thresholds are exceeded.

It can be set to alert users when a preset number of unsuccessful attempts to enter an authorization code is reached, when after-hours or weekend calls are made and when calls are dialed to and from specific locations.

Once triggered, Pollcat II+ can send a message to a local personal computer or via modem to a remote PC, dial a pager number or light a visual indicator on Pollcat II+, which is a small self-con-

tained device.

Once alerted, net managers can respond by changing the direct-inward system access code, shutting down the port or blocking access to long-distance facilities from voice mail systems.

Pollcat II+ can generate a report of the events that triggered the alarm. Each call record that contributed to the alarm can be retrieved from the unit.

The device works with any PBX that can send ASCII data via an RS-232 port to an attached device. The unit connects to either a station message detail recording port or another specified port on the switch. Pollcat II+ includes an RS-232 serial port for communications with a local PC or high-speed modem for communication with a remote PC for notification.

Customers can use a real-time clock and calendar to provide off-hours parameter scheduling. Pollcat II+ also has built-in battery-backed memory.

The Pollcat II+, with 64K bit/sec memory, will cost \$1,795 when it becomes available in July.

For more information, contact Western Telematic at (800) 854-7226. ☐

## Regulatory Update

Labeling **Bell Atlantic Corp.**'s newly filed tariffs for T-1 and digital data service as discriminatory and predatory, **Metropolitan Fiber Systems, Inc. (MFS)** last week asked the Federal Communications Commission to suspend or reject the two-, three- and five-year term pricing plans for discounts up to 30%.

Under Bell Atlantic's proposed tariffs, carriers terminating contracts would face charges of only 15% of the remaining channel termination payments and 30% of the remaining channel mileage and other rate element payments.

MFS said these liability charges are well below the 50%-to-70% penalty levels set by other Bell companies and would not cover the cost of premature cancellations.

The 15% liability charge for channel terminations would allow Bell Atlantic "to provide its most highly discounted channel termination rates to preferred interexchange carrier customers without restriction," MFS said.

The carrier added that the scheme "makes a mockery of the term discount rate structure by encouraging a select group of customers to order service at the most highly discounted rates risk-free." ☐





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You don't have to worry about data access, because users will enjoy timely and transparent access to all systems on the network — including the mainframe.

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Go on, call. Your company has waited long enough.

 **Sun Microsystems**  
Computer Corporation


\*Among all the UNIX servers made today, the Sun SPARCserver 690MP recently scored the highest Transaction Processing Performance Council benchmarks for price and performance (TPC-A). Details will be included in the Database Performance Brief offered above. ©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, the Sun logo and DataBase Excelerator are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCserver is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other product or service names mentioned herein are trademarks of their respective owners.



# ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

## Worth Noting

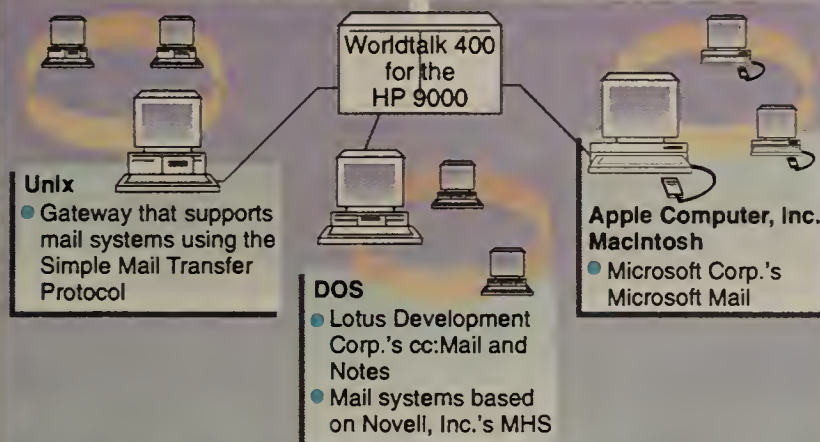
“For IBM, the significance of turning to Lotus [Development Corp.’s] Notes for its OfficeVision/2 LAN offering is that its customers will gain a strong group capability.”

Ann Palermo

Director of work group and messaging research  
International Data Group  
Framingham, Mass.

## Worldtalk introduces RISC-based messaging server

Corporate or public X.400 messaging backbone



Worldtalk 400 software links popular PC LAN E-mail systems and provides access to other X.400-based corporate mail systems.

GRAPHIC BY SUSAN J. CHAMPENY

## Server pack links LAN mail systems to X.400 networks

Runs on Hewlett-Packard 9000 RISC platform.

By Timothy O'Brien  
West Coast Bureau Chief

LOS GATOS, Calif. — Worldtalk Corp., a new company formed to sell and support X.400 messaging connectivity software developed by now defunct Touch Communications, Inc., has just released its messaging server software for the Hewlett-Packard Co. 9000 platform.

The new product, Worldtalk 400 for the HP 9000, provides the conversions necessary to link industry-leading personal computer-based electronic mail systems to X.400-based corporate E-mail systems.

Worldtalk 400 supports E-mail systems such as Lotus Development Corp.'s cc:Mail and Notes, Microsoft Corp.'s Microsoft Mail and CE Software, Inc.'s QuickMail as well as mail systems based on Novell, Inc.'s Message Handling Service (MHS). On the Unix side, Worldtalk 400 has a gateway that supports mail systems using the Simple Mail Transfer Protocol.

“The HP 9000 can be used as the central link that connects all the LAN-based E-mail to the enterprise network,” said Mark Stieglitz, vice-president of marketing at Worldtalk.

First released as PC-LAN Server in 1990 by Touch, the Worldtalk 400 product consists of server software for the HP 9000 that handles the conversion of dissimilar E-mail systems and gateway software on the various LANs.

The gateway software typically resides on LAN clients above

DOS, Windows or OS/2, as well as Apple Computer, Inc.'s Macintosh computers and Unix workstations.

These clients access the Worldtalk 400 server via connectivity options available through the HP 9000, including HP's Network File System protocol, Novell's NetWare for Unix and Microsoft's LAN Manager for Unix.

Since the Worldtalk 400 server is also used to centralize configuration and management func-

The gateway software typically resides on LAN clients above DOS, Windows or OS/2.



tions, Worldtalk decided to move the software to the Reduced Instruction Set Computing-based HP 9000 to achieve higher performance and to provide better access to enterprise nets through HP's X.400 Open Systems Interconnection technology.

Worldtalk is continuing to work with HP to provide an X.500 directory module that will allow LAN mail directories to be integrated with HP's X.500 product. Worldtalk 400 is available now. Pricing begins at \$23,950, with gateways sold separately for \$1,500 each. ■

## CA offers customers new pricing options

Downsizing initiatives and shift to net environments forces company to reevaluate its pricing structure.

By Timothy O'Brien  
West Coast Bureau Chief

ISLANDIA, N.Y. — In an effort to accommodate customer efforts to downsize and migrate to network environments, Computer Associates International, Inc. (CA) recently announced a major restructuring of its software pricing policy and introduced a new service program.

Moving away from a tier pricing approach based on the size and configuration of the computer in which its software runs, CA is now offering programs that include credits or discounts for users that downsize to a different platform, consolidate software onto fewer CPUs or implement the same software across an enterprise network.

“The tier pricing approach served the industry for many years, but now users are installing our software on all types of platforms,” said Sanjay Kumar, senior vice-president of planning

at CA. “We needed to come up with an alternative pricing program.”

CA will continue tier pricing as an option because, in certain instances, it can still be beneficial to companies installing CA software on smaller host or mid-range systems.

For many users, however, the new pricing strategies eliminate many restrictions, penalties and complicated arrangements that have previously plagued users wanting to downsize or centralize control of their information systems group.

### New options

The first new program is an investment savings plan that gives customers a credit of as much as 50% off the original license fee of software that becomes redundant when multiple CPUs are replaced by fewer but larger CPUs.

CA has also introduced an up-

(continued on page 22)

## Firm adds client/server project management pack

By Joanne Cummings  
Senior Writer

FAIRFAX, Va. — Lucas Management Systems, Inc. has unveiled a client/server version of its Artemis Prestige project management software.

The software, which offers a Microsoft Corp. Windows client interface, frees users to employ the most appropriate processor as a server. For example, CPU-intensive processes such as time analysis, resource scheduling and graphics manipulation can be performed on the local-area network server or minicomputer, while tasks such as data entry and screen handling can be done at the workstation.

In addition, the client portion can communicate with multiple servers on different machines, allowing users to take advantage of several resources at once.

According to early users, the client/server aspect is important.

“People in our organization, as well as those within our client base, require intelligent desktop workstations with real-time access to distributed corporate databases,” said Dick Kennedy, director of program management at Integrus and an early user of the software. “Prestige for Windows provides project management in that kind of format.”

Like the previous character-based version, Artemis Prestige for Windows Version 1.1 enables users to manage aspects of multiple projects, including establishing task priorities, scheduling resources and project milestones, and tracking project costs.

The client software runs on any 80386-based personal computer with Windows 3.0. The server portion can run on a Digital Equipment Corp. VAX/VMS machine or a server running Novell, Inc.'s NetWare, Banyan Sys-

(continued on page 22)

## Store & Forward

Samsung Software America (SSA) has announced Replix, a Unix-based facsimile management system, which is its first product in what will be a suite of Unix-based shrink-wrapped commercial office applications.

Operating in a client/server configuration, Replix allows users to send, receive, route, view and manage faxes directly from a workstation or computer connected to a Replix server on a Unix network.

Users can receive, preview and route faxes in a one-step process that takes advantage of Replix's own graphical user interface. In addition, Replix automatically notifies users of incoming faxes and informs them of the status of outgoing faxes.

Samsung will begin shipping Replix in May. Pricing will be determined based on the number of concurrent users. Starting at \$2,395, the base package includes software for two concurrent clients, unlimited servers, and support for one modem and PostScript. Support for additional concurrent clients and fax modems is available separately.

For more information, call SSA at (508) 686-7200. ■



## CA offers customers new pricing options

*continued from page 21*

grade savings plan that allows existing tier pricing customers to migrate programs to any platform as long as the license is active. These plans are designed for customers involved in data center consolidation and for those that anticipate rapid growth of their computing requirements.

Recognizing that maintenance costs are another area of concern, CA has introduced a maintenance savings plan that

gives users discounts on annual fees if they commit to a multiyear maintenance agreement. For a one-time subscription fee of 30% of the maintenance fee list price, users can lock in their maintenance rate and reduce their yearly fee by 40%.

Another plan that is intended to provide large organizations with greater flexibility in implementing CA software is the enterprise license program, which gives customers the right to use a specific product on any number of CPUs within an organization. The license fee is based on standard industry-accepted calculations of the total

number of million instructions per second on all CPUs in the enterprise.

Finally, CA is introducing a rightsizing savings plan which is designed for corporations that plan on using the same software on different sized CPUs. For instance, a customer could exchange a program that runs in a host MVS environment for a version that runs on a Unix-based computer and gain the same type of credit available under the investment savings plan.

Kumar said CA is still evaluating what changes, if any, need to be done to its personal computer and local-area network

pricing. CA already offers a network license for PC LAN configurations, a site license and a corporate license for its PC software products.

Pricing in the PC and LAN area is complicated, he said, because there are several levels of distribution for CA's software as well as new client/server configurations that are redefining the scope and functionality of some of its earlier programs.

In the restructuring of its service organization, CA has put in place client service and technical service representatives that have no direct sales role. In this way, CA hopes to provide its customers a single point of contact to coordinate many aspects of its customer service.

The pricing programs go into effect immediately. Additional information about CA's new client service program is available by calling (800) 342-5224. **■**

## Firm adds client/server mgmt. pack

*continued from page 21*

tems, Inc.'s VINES, Microsoft LAN Manager and IBM's LAN Server.

The software supports access to Oracle Corp.'s Oracle and Gupta Technologies, Inc.'s SQLBase databases, enabling users to store project management data and access other data to build graphics and reports.

The software comes bundled with Gupta's Qwest query tool, which enables users to pull data out of an SQL-based database and build graphics-based reports.

According to Kennedy, Integris, a subsidiary of Bull HN Worldwide Information Systems, Inc. in Billerica, Mass., chose Prestige for Windows because "client/server is a way of life at Integris — compatibility with this architecture was a prerequisite. Unless project management fits this mold, the high-level project managers and programmers will reject it."

Integris is running the server portion of the software on a Bull Unix-based server supporting 122 personal computers.

Kennedy also said the Windows-compatibility was important because the project management system had to be easy to use.

"If it did not run under Windows, it would not get used and data would never make it into the system," he said.

A key feature of the software is its "what-if" capability, which enables users to see how changes in resource allocations, for example, will affect a project's schedule. "Prestige's what-if capability will allow us to project the status of deliverables, highlighting any bottlenecks so we can deal with them before they become problems," he said.

In addition, Kennedy said the software enables the firm to accurately track project costs, enabling it to provide more accurate job bids. "As new projects come on-line on the system, the application will hone our competitive edge," he said.

Available now, the software is priced depending on the number of LAN nodes and the number of concurrent users. For example, a LAN server version supporting 50 seats and 20 concurrent users costs \$76,750, while a VAX server version supporting 50 seats and 20 concurrent users costs \$124,750. **■**

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# Pass Along Application

## 1 Industry: (check one only)

- 01. ☐ Manufacturers (other than computer/communications)
- 02. ☐ Finance/Banking
- 03. ☐ Insurance
- 04. ☐ Real Estate
- 05. ☐ Healthcare Services
- 06. ☐ Legal
- 07. ☐ Hospitality
- 08. ☐ Retail/Wholesale Trade
- 09. ☐ Transportation
- 10. ☐ Utilities
- 11. ☐ Education
- 12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
- 13. ☐ Government State/Local
- 14. ☐ Government Federal
- 15. ☐ Military
- 16. ☐ Aerospace
- 17. ☐ Consultants (Independent)
- 18. ☐ Carriers
- 19. ☐ Interconnects
- 20. ☐ Manufacturers (Computer/Communications)
- 21. ☐ VAR/VAD/Systems House
- 22. ☐ Distributor, Computer Related
- 23. ☐ Distributor, Communications Related
- 24. ☐ Other \_\_\_\_\_

## 2 What is your job function? (check one only)

- NETWORKING MANAGEMENT**
- 1. ☐ Networking Mgmt      3. ☐ Datacom/Telecom Mgmt
- 2. ☐ LAN Mgmt              4. ☐ Engineering Mgmt

### MIS MANAGEMENT

- 5. ☐ MIS, IS, IT, Mgmt
- 6. ☐ Engineering Mgmt

### CORPORATE MANAGEMENT

- 7. ☐ Corporate Mgmt (CIO, CEO, Pres, VP, Dir, Mgr, Financial Mgmt)

- 8. ☐ Consultant (Independent)

- 9. ☐ Other \_\_\_\_\_

## 3 What is the total number of sites for which you have purchase influence? (check one only)

- 1. ☐ 100+      3. ☐ 20 - 49      5. ☐ 2 - 9
- 2. ☐ 50 - 99      4. ☐ 10 - 19      6. ☐ 1

## 4 Check all that apply in columns A and B:

A: I am involved in the purchase of the following products/services.

B: I plan to purchase the following products/services in the next 12 months.

- | Involved                     | Plan to Purchase         |  |
|------------------------------|--------------------------|--|
| A                            | B                        |  |
| <b>LOCAL-AREA NETWORKS</b>   |                          |  |
| 01. <input type="checkbox"/> | <input type="checkbox"/> | Local-Area Networks  |
| 02. <input type="checkbox"/> | <input type="checkbox"/> | LAN Servers  |
| 03. <input type="checkbox"/> | <input type="checkbox"/> | LAN Operating Systems Software   |
| 04. <input type="checkbox"/> | <input type="checkbox"/> | Superservers   |
| 05. <input type="checkbox"/> | <input type="checkbox"/> | Data Base Servers (Oracle, Sybase, etc)                                  |
| 06. <input type="checkbox"/> | <input type="checkbox"/> | Terminal Servers   |
| 07. <input type="checkbox"/> | <input type="checkbox"/> | LAN Services   |
| 08. <input type="checkbox"/> | <input type="checkbox"/> | LAN Storage Devices (Optical, Tape, Disk, Etc. including Backup Systems) |
| 09. <input type="checkbox"/> | <input type="checkbox"/> | Network Test Equipment   |
| 10. <input type="checkbox"/> | <input type="checkbox"/> | Hubs   |
| 11. <input type="checkbox"/> | <input type="checkbox"/> | Cables, Connectors, Baluns   |
| 12. <input type="checkbox"/> | <input type="checkbox"/> | UPS  |
| 13. <input type="checkbox"/> | <input type="checkbox"/> | Network Adapter Boards   |
| 14. <input type="checkbox"/> | <input type="checkbox"/> | Central Office LANs  |
| 15. <input type="checkbox"/> | <input type="checkbox"/> | Wireless LANs  |
| 16. <input type="checkbox"/> | <input type="checkbox"/> | SNMP Network Management  |
| <b>INTERNETWORKING</b>       |                          |  |
| 17. <input type="checkbox"/> | <input type="checkbox"/> | Bridges  |
| 18. <input type="checkbox"/> | <input type="checkbox"/> | Routers  |
| 19. <input type="checkbox"/> | <input type="checkbox"/> | Gateways   |
| 20. <input type="checkbox"/> | <input type="checkbox"/> | Bridge/Router  |
| 21. <input type="checkbox"/> | <input type="checkbox"/> | Hubs   |
| 22. <input type="checkbox"/> | <input type="checkbox"/> | Intelligent Hubs   |
| 23. <input type="checkbox"/> | <input type="checkbox"/> | Communications Servers   |
| <b>COMPUTERS/PERIPHERALS</b> |                          |  |
| 24. <input type="checkbox"/> | <input type="checkbox"/> | Micros/PCs   |

## 5 What are your primary responsibilities? (check all that apply)

- 1. ☐ LANs                      3. ☐ WANs
- 2. ☐ Internetworking

## 6 What is the scope of your involvement in purchase decisions for Network products & services? (check one only)

- 1. ☐ Enterprisewide (Organization/Subsidiary/Division)
- 2. ☐ Multienterprise (Consultants)
- 3. ☐ Departmentwide

## 7 Is your network: (check all that apply)

- LOCAL AREA NETWORKS**
- 1. ☐ Local (within building)
- 2. ☐ Local (in a campus environment)

### WIDE AREA NETWORKS

- 3. ☐ International
- 4. ☐ National
- 5. ☐ Regional (several states)
- 6. ☐ Metropolitan

## 8 Which of the following network architectures/protocols are used? (check all that apply)

- |   |   |
|---|---|
| 01. <input type="checkbox"/> SNA          | 08. <input type="checkbox"/> X.25             |
| 02. <input type="checkbox"/> DECNET       | 09. <input type="checkbox"/> NOVELL IPX/SPX   |
| 03. <input type="checkbox"/> OSI          | 10. <input type="checkbox"/> APPC/APPN/LU 6.2 |
| 04. <input type="checkbox"/> GOSIP        | 11. <input type="checkbox"/> NETBIOS          |
| 05. <input type="checkbox"/> MAP/TOP      | 12. <input type="checkbox"/> DEC LAT          |
| 06. <input type="checkbox"/> TCP/IP       | 13. <input type="checkbox"/> APPLE TALK       |
| 07. <input type="checkbox"/> DCA (Unisys) | 14. <input type="checkbox"/> OTHER            |

## 9 What is your LAN Operating System? (check all that apply)

- 01. ☐ LOCAL TALK (APPLE TALK)
- 02. ☐ BANYAN (VINES)
- 03. ☐ DCA (IRMALAN)
- 04. ☐ IBM (LAN SERVER)
- 05. ☐ IBM (PC LAN PROGRAM)
- 06. ☐ MICROSOFT (LAN MANAGER)
- 07. ☐ UNGERMANN-BASS
- 08. ☐ NOVELL (NETWARE, 2.X, 3.X)
- 09. ☐ PROTEON (PRONET)
- 10. ☐ SITKA (TOPS)
- 11. ☐ 3COM (3+, 3+ OPEN)
- 12. ☐ Other \_\_\_\_\_

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YES ☐ NO ☐

Signature \_\_\_\_\_ Date \_\_\_\_\_

Business Phone \_\_\_\_\_

## B. Please Provide your Name, Title & Company Address.

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TITLE \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

DIVISION/DEPARTMENT \_\_\_\_\_

STREET ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Must answer questions 1-18.

Sign and Date the Form to Apply.

# Pass-Along Qualification Form

- |                              |                          |                                  |                              |                          |                             |
|------------------------------|--------------------------|----------------------------------|------------------------------|--------------------------|-----------------------------|
| 25. <input type="checkbox"/> | <input type="checkbox"/> | Minis                            | 58. <input type="checkbox"/> | <input type="checkbox"/> | Protocol Converters         |
| 26. <input type="checkbox"/> | <input type="checkbox"/> | Mainframes                       | 59. <input type="checkbox"/> | <input type="checkbox"/> | Network Management Systems  |
| 27. <input type="checkbox"/> | <input type="checkbox"/> | Laptops                          | 60. <input type="checkbox"/> | <input type="checkbox"/> | Terminal Emulation Boards   |
| 28. <input type="checkbox"/> | <input type="checkbox"/> | Workstations                     | 61. <input type="checkbox"/> | <input type="checkbox"/> | Diagnostic/Test Equipment   |
| 29. <input type="checkbox"/> | <input type="checkbox"/> | Image Processing Workstations    | 62. <input type="checkbox"/> | <input type="checkbox"/> | DSU/CSU                     |
| 30. <input type="checkbox"/> | <input type="checkbox"/> | Front-End Processors             | 63. <input type="checkbox"/> | <input type="checkbox"/> | Data Compression Equipment  |
| 31. <input type="checkbox"/> | <input type="checkbox"/> | Terminals                        | 64. <input type="checkbox"/> | <input type="checkbox"/> | Microwave                   |
| 32. <input type="checkbox"/> | <input type="checkbox"/> | Printers                         | 65. <input type="checkbox"/> | <input type="checkbox"/> | Fax Boards                  |
| 33. <input type="checkbox"/> | <input type="checkbox"/> | Cluster Controllers              | 66. <input type="checkbox"/> | <input type="checkbox"/> | VSAT                        |
| 34. <input type="checkbox"/> | <input type="checkbox"/> | Fax Machines                     | 67. <input type="checkbox"/> | <input type="checkbox"/> | Fiber Optic                 |
|                              |                          |                                  | 68. <input type="checkbox"/> | <input type="checkbox"/> | Satellite                   |
|                              |                          |                                  | 69. <input type="checkbox"/> | <input type="checkbox"/> | ISDN                        |
| 35. <input type="checkbox"/> | <input type="checkbox"/> | Network Management               | 70. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (over 1000 lines)      |
| 36. <input type="checkbox"/> | <input type="checkbox"/> | Micro to Mainframe               | 71. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (200 - 1000 lines)     |
| 37. <input type="checkbox"/> | <input type="checkbox"/> | Network Security                 | 72. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (under 200 lines)      |
| 38. <input type="checkbox"/> | <input type="checkbox"/> | Call Accounting                  | 73. <input type="checkbox"/> | <input type="checkbox"/> | Automatic Call Distributors |
| 39. <input type="checkbox"/> | <input type="checkbox"/> | Communication                    | 74. <input type="checkbox"/> | <input type="checkbox"/> | Voice Messaging Systems     |
| 40. <input type="checkbox"/> | <input type="checkbox"/> | Word Processing                  | 75. <input type="checkbox"/> | <input type="checkbox"/> | Videoconferencing Systems   |
| 41. <input type="checkbox"/> | <input type="checkbox"/> | Data Base Management             | 76. <input type="checkbox"/> | <input type="checkbox"/> | Central Office Switch       |
| 42. <input type="checkbox"/> | <input type="checkbox"/> | Spreadsheet                      | 77. <input type="checkbox"/> | <input type="checkbox"/> | Voice Response/Processing   |
| 43. <input type="checkbox"/> | <input type="checkbox"/> | Groupware                        | 78. <input type="checkbox"/> | <input type="checkbox"/> | Switched Voice              |
| 44. <input type="checkbox"/> | <input type="checkbox"/> | EDI                              | 79. <input type="checkbox"/> | <input type="checkbox"/> | Dedicated Leased Line       |
| 45. <input type="checkbox"/> | <input type="checkbox"/> | E-Mail                           | 80. <input type="checkbox"/> | <input type="checkbox"/> | Digital Data                |
| 46. <input type="checkbox"/> | <input type="checkbox"/> | Windows/Graphical User Interface | 81. <input type="checkbox"/> | <input type="checkbox"/> | Switched Data               |
| 47. <input type="checkbox"/> | <input type="checkbox"/> | 4-GL                             | 82. <input type="checkbox"/> | <input type="checkbox"/> | Centrex                     |
| 48. <input type="checkbox"/> | <input type="checkbox"/> | Multimedia                       | 83. <input type="checkbox"/> | <input type="checkbox"/> | On-Line Information         |
| 49. <input type="checkbox"/> | <input type="checkbox"/> | Graphics                         | 84. <input type="checkbox"/> | <input type="checkbox"/> | E-Mail                      |
|                              |                          |                                  | 85. <input type="checkbox"/> | <input type="checkbox"/> | SMDS                        |
|                              |                          |                                  | 86. <input type="checkbox"/> | <input type="checkbox"/> | Image Processing            |
| 50. <input type="checkbox"/> | <input type="checkbox"/> | Modems (9.6kbps and over)        | 87. <input type="checkbox"/> | <input type="checkbox"/> | Audio Teleconferencing      |
| 51. <input type="checkbox"/> | <input type="checkbox"/> | Modems (under 9.6kbps)           | 88. <input type="checkbox"/> | <input type="checkbox"/> | Local Services              |
| 52. <input type="checkbox"/> | <input type="checkbox"/> | T-1                              | 89. <input type="checkbox"/> | <input type="checkbox"/> | WATS MTs                    |
| 53. <input type="checkbox"/> | <input type="checkbox"/> | T-3                              | 90. <input type="checkbox"/> | <input type="checkbox"/> | International               |
| 54. <input type="checkbox"/> | <input type="checkbox"/> | Fractional T-1                   | 91. <input type="checkbox"/> | <input type="checkbox"/> | Virtual Networks            |
| 55. <input type="checkbox"/> | <input type="checkbox"/> | Data Switches                    | 92. <input type="checkbox"/> | <input type="checkbox"/> | Frame Relay                 |
| 56. <input type="checkbox"/> | <input type="checkbox"/> | Matrix Switches                  | XX. <input type="checkbox"/> | <input type="checkbox"/> | None of the above           |
| 57. <input type="checkbox"/> | <input type="checkbox"/> | Packet Switching                 |                              |                          |                             |

## 10 What is your LAN environment? (check all that apply)

- 1. ☐ 4M TOKEN RING      6. ☐ FDDI
- 2. ☐ 16M TOKEN RING      7. ☐ LOCAL TALK
- 3. ☐ ARCNET              8. ☐ 10BASE-T
- 4. ☐ ETHERNET            9. ☐ OTHER \_\_\_\_\_
- 5. ☐ STARLAN

## 11 Are you involved in the implementation of client/server applications?

Yes ☐ No ☐

## 12 Which operating system do you utilize? (check all that apply)

- |   |                                      |
|---|--------------------------------------|
| 01. <input type="checkbox"/> DOS          | 06. <input type="checkbox"/> VM      |
| 02. <input type="checkbox"/> UNIX/XENIX   | 07. <input type="checkbox"/> VMS     |
| 03. <input type="checkbox"/> OS/2         | 08. <input type="checkbox"/> NUBUS   |
| 04. <input type="checkbox"/> OS/2 EX. ED. | 09. <input type="checkbox"/> WINDOWS |
| 05. <input type="checkbox"/> MVS          | 10. <input type="checkbox"/> OTHER   |

## 13 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- 1. ☐ Europe                      4. ☐ Australia
- 2. ☐ Asia                        5. ☐ Middle East
- 3. ☐ South America

## 14 Which of the following vendors equipment do you currently have installed in your network? (check all that apply)

- | Vendor              | Mainframes               | Minis                    |
|---------------------|--------------------------|--------------------------|
|                     | A                        | B                        |
| 01. DEC             | <input type="checkbox"/> | <input type="checkbox"/> |
| 02. IBM             | <input type="checkbox"/> | <input type="checkbox"/> |
| 03. AMDAHL          | <input type="checkbox"/> | <input type="checkbox"/> |
| 04. AT&T            | <input type="checkbox"/> | <input type="checkbox"/> |
| 05. BULL HNIS       | <input type="checkbox"/> | <input type="checkbox"/> |
| 06. NCR             | <input type="checkbox"/> | <input type="checkbox"/> |
| 07. DATA GENERAL    | <input type="checkbox"/> | <input type="checkbox"/> |
| 08. WANG            | <input type="checkbox"/> | <input type="checkbox"/> |
| 09. HEWLETT-PACKARD | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. PRIME           | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. TANDEM          | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. UNISYS          | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. CONTROL DATA    | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. OTHER           | <input type="checkbox"/> | <input type="checkbox"/> |

## 15 Please indicate the number of Microcomputers/Workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

Micros/Workstations	Presently Installed	Plan to Install Next 12 Months
	A	B

- |                                 |      |  |
|---------------------------------|------|--|
| 1. Macintosh                    | XXXX |  |
| 2. PCs Based on 80586 Chips     |      |  |
| 3. PCs Based on 80486 Chips     |      |  |
| 4. PCs Based on 80386 Chips     |      |  |
| 5. PCs Based on 80286 Chips     |      |  |
| 6. PCs Based on 8086/8088 Chips |      |  |
| 7. Risc-Based Workstations      |      |  |
| 8. Unix-Based Workstations      |      |  |

## 16 Estimated value of networking equipment and services:

A. Which you helped specify, recommend or approved in the last 12 months?

B. Which you plan to help specify, recommend or approve in the next 12 months?

- | A                           | B                        |
|-----------------------------|--------------------------|
| 1. <input type="checkbox"/> | <input type="checkbox"/> |
| 2. <input type="checkbox"/> | <input type="checkbox"/> |
| 3. <input type="checkbox"/> | <input type="checkbox"/> |
| 4. <input type="checkbox"/> | <input type="checkbox"/> |
| 5. <input type="checkbox"/> | <input type="checkbox"/> |
| 6. <input type="checkbox"/> | <input type="checkbox"/> |
| 7. <input type="checkbox"/> | <input type="checkbox"/> |
| 8. <input type="checkbox"/> | <input type="checkbox"/> |
| 9. <input type="checkbox"/> | <input type="checkbox"/> |

## 17 Estimated gross annual revenue of your entire company/institution: (check one only):

- |  |  |
|--|--|
| 1. <input type="checkbox"/> Over \$10 billion        | 5. <input type="checkbox"/> \$50 to \$99.9 million |
| 2. <input type="checkbox"/> \$1 to \$9.9 billion     | 6. <input type="checkbox"/> \$10 to \$49.9 million |
| 3. <input type="checkbox"/> \$500 to \$1 billion     | 7. <input type="checkbox"/> \$5 to \$9.9 million   |
| 4. <input type="checkbox"/> \$100 to \$499.9 million | 8. <input type="checkbox"/> Under \$5 million      |

## 18 Estimated number of employees for your entire corporation:

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Over 10,000   | 4. <input type="checkbox"/> 1,000 - 2,499 |
| 2. <input type="checkbox"/> 5,000 - 9,999 | 5. <input type="checkbox"/> 500 - 999     |
| 3. <input type="checkbox"/> 2,500 - 4,999 | 6. <input type="checkbox"/> Under 500     |



# INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

## Worth Noting

Of the 27 networking companies that received initial venture funding last year, seven were in the wireless communications market, according to venture capital firm Accel Partners of Princeton, N.J.

### Wellfleet and its hub partners

#### Recent technical and marketing agreements

- January** Wellfleet Communications, Inc. and Bytex Corp. agree to jointly develop routing modules for Bytex's 7700 Intelligent Switching Hub.
- April** Wellfleet and Fibermux Corp. agree to codevelop a router module for Fibermux's Crossbow hubs. Fibermux also signs on as a Wellfleet router reseller.
- Wellfleet and Ungermann-Bass, Inc. announce plans to test interoperability between their routers and develop network management applications for them. Ungermann-Bass also agrees to sell and support stand-alone Wellfleet routers to complement its own hub-based ones.
- Wellfleet signs on Cabletron Systems, Inc. to sell and support Wellfleet routers.

GRAPHIC BY SUSAN J. CHAMPENY

## UB, Wellfleet team up to make products compatible

Wellfleet also signs UB, Cabletron as resellers.

By Maureen Molloy  
Senior Writer

BEDFORD, Mass. — Ungermann-Bass, Inc. and Wellfleet Communications, Inc. have announced they will work together to ensure interoperability of their products and jointly develop applications to simplify internet-work management.

Wellfleet also announced agreements with Ungermann-Bass and Cabletron Systems, Inc. through which the hub vendors will sell and support Wellfleet's bridge/routers. Neither agreement, however, calls for Wellfleet to develop router cards for the vendors' hubs.

The deals bring the number of hub vendors who will resell Wellfleet gear to four. Earlier this year, Wellfleet, based here, penned resale agreements with Bytex Corp. and Fibermux Corp. and agreed to work with the vendors in developing routing modules for their intelligent hubs.

Under the technology sharing agreement with Ungermann-Bass, the two companies will exchange information and commit engineering resources to achieve interoperability between Wellfleet routers and Ungermann-Bass hubs.

"Our aim is to deliver true compatibility between our two product lines," said Ralph Ungermann, president and chief executive officer of Ungermann-Bass, on the agreement with Wellfleet. "Both vendors will offer up their proprietary information, which will allow true interoperability to exist."

The bridge/router modules Ungermann-Bass has jointly developed with Advanced Computer Communications for Ungermann-Bass' Access/One Enterprise Hub will also be compatible with Wellfleet's gear, he added.

Ungermann said his company will also develop applications for managing Wellfleet routers that run under Ungermann-Bass' Net-Director network management system. Initially, Ungermann-Bass will use NetDirector's Object

The deals bring the number of hub vendors who will resell Wellfleet gear to four.



Modeling Technology to manage Wellfleet routers.

According to Ungermann-Bass, this will be followed by a second phase of Simple Network Management Protocol-based management applications it designed to simplify router management even further by taking advantage of Wellfleet's new SNMP management extensions. The extensions include SNMP's GET and SET commands and offer a new level of control over Wellfleet devices.

Both companies declined to provide further details about the agreement. □

## Start-up to provide integrated access gear

Premisys to roll out products that will give users access to private and switched carrier services.

By Bob Brown  
Senior Editor

PALO ALTO, Calif. — Start-up Premisys Communications, Inc. is readying a line of network products designed to give users integrated access to carriers' private and switched services, including frame relay offerings.

The firm has already shipped the products to beta sites and is looking to publicly announce the gear in June or July, according to Bob Lefkowitz, vice-president of marketing at Premisys.

The integrated access products will support the signaling required to give T-1 users access to multiple carrier services and support for inverse multiplexing capabilities, Lefkowitz said. He declined to provide further details, such as the product architecture, names or pricing, although other sources said the pricing looks attractive and may possibly be as low as \$10,000 per device.

"In the old days, there were [only] private nets, such as T-1s, but now carriers are offering all kinds of services, such as frame relay and ISDN," he said. "Customers are going to need more

intelligent access equipment."

Premisys hopes to get in the market between the high-end mux vendors, such as Network Equipment Technologies, Inc. and Newbridge Networks Corp., and the inverse multiplexer vendors, such as Ascend Communications, Inc. and Teleos Communications, Inc., Lefkowitz said. In other words, Premisys will provide devices that are more intelligent than inverse muxes in that they perform true multiplexing but are less full-featured than high-end muxes designed as backbone nodes, he said.

Premisys was founded in August 1990 by Ray Lin, a former senior vice-president at Telco Systems, Inc. and general manager of Telco Systems' Network Access Corp. business unit. Premisys, which employs about 25 people, recently closed its second round of venture capital financing. The company's investors include Burr Egan Deleage & Co. and The Waldon Group.

An investment firm spokesman who requested anonymity said his firm decided not to back (continued on page 27)

## INDUSTRY BRIEFS

**NADF X.500 directory pilot under way.** The North American Directory Forum (NADF) announced it has begun the first round of tests of its multivendor X.500 directory services pilot project. In the pilot's first year, the 17 NADF members will exchange directory data to ensure interoperability. Later, they will test X.500 user agents developed by software and hardware vendors.

**NET reports annual financials.** Network Equipment Technologies, Inc. (NET) last week reported a net loss of \$11.2 million for fiscal 1992, which ended March 31, compared with a net loss of \$46.1 million for 1991. The 1992 loss includes a \$13.4 million charge resulting from the settlement of consolidated class-action lawsuits in the second quarter. NET's 1992 revenue was \$180.8 million, up from \$135 million last year.

**General DataComm posts financials.** Middlebury, Conn.-based General DataComm Industries, Inc. reported revenues of \$47.3 million for the second quarter, compared with \$48.6 million for the same quarter last year. Net income was \$164,000, down from \$361,000 for the corresponding quarter in 1991. □

## People & Positions

Cisco Systems, Inc., a Menlo Park, Calif., router maker, has named **Frank Marshall** vice-president of engineering.

He will be responsible for all engineering activities for the company and will report to John Morgridge, Cisco's president and chief executive officer. Previously, Marshall was senior vice-president of product development at Convex Computer Corp. in Richardson, Texas.

Marshall replaces Bob Runge, who was brought into Cisco on a temporary contract basis as head of engineering.

**Coral Network Corp.**, a Marlborough, Mass., internet-working equipment start-up, has named **Walter Jones** to the newly created position of vice-president of engineering. He will be responsible for the design and development of Coral's products.

Previously, Jones was vice-president of engineering for Prime Computer, Inc.

**Michael Gardner** has been named to the newly created position of chief operating officer at **Advanced Computer Communications**, a Cupertino, Calif., bridge and router maker.

Gardner will oversee product development, manufacturing (continued on page 26)



## Nightmare Scenario #2

# THE RUNAWAY CASH SUCKER.

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for 5, 10, or 20 users!

**“Why didn’t someone tell me this @\$!?!& network would cost so much?”**

**A** lot of executives go pale when they see how much their computer networks are really costing them.

“What’s with all this new payroll?” they ask. “I thought this thing was going to save us money.”

Too late. They’re strapped to a runaway cash sucker and heading downhill fast.

The fact is, the real economics of running a computer network are never even mentioned by the people trying to sell you one.

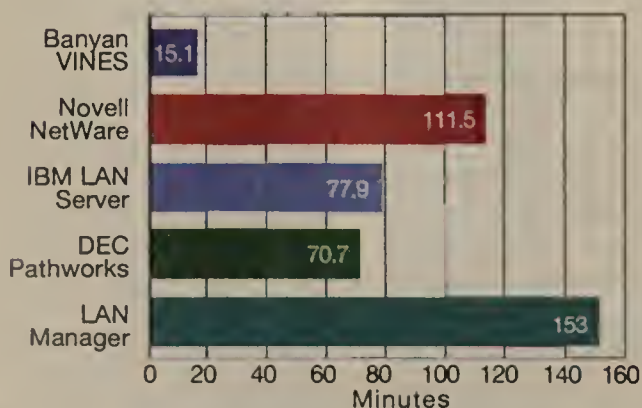
And not knowing can cost you plenty.

### Research proves Banyan more cost-effective than Novell, IBM, DEC and Microsoft.

Which brings us to the research report offered free on this page.

It was compiled by the Business Research Group, and shows how

Time Required To  
Add A Network-Wide Service

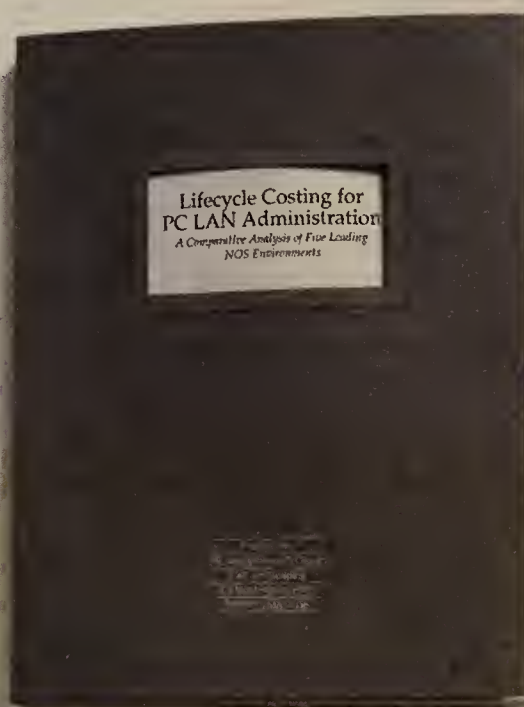


Business Research Group/Newton, MA bc16D

*For sheer cost-effectiveness,  
Banyan surpasses everyone.*

Banyan®, Novell®, IBM®, DEC®, and Microsoft® stack up against each other in cost of operation.

What BRG did was to interview the day-to-day LAN managers at 180 different organizations about the length of time required to execute 11 typical network functions.



*Send for this impartial survey  
of network cost-efficiency. It's full  
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And faster translates into smaller staffs and lower cash outlays.

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# MANAGEMENT STRATEGIES

ENTERPRISE NETWORK STRATEGIES, USER GROUPS AND MANAGING PEOPLE AND TECHNOLOGY

## Dialogue

**Do you think the development of a gigabit-speed nationwide network will help the U.S. compete?**

“At the universities, we’re somewhat accustomed to these high-speed, nationwide networks. Most of us are on the various internets that the [federal government] provides, and we use them extensively in accomplishing our research mission.”

“If the private sector had access to that type of infrastructure, it could potentially be very beneficial in the transfer of knowledge and information, which should improve our collective research and development capability.”

**Jeffrey Lipton**

Director of office support and telecommunications services  
University of Colorado  
Boulder

“We have to be careful that we don’t pursue a ‘Field of Dreams’ concept where we assume that once the network is in place, everyone will use it. The deployment of such a net has to be driven by user need.”

“Will such a network help us compete? It depends how carefully it’s planned and how well it’s deployed.”

**Bill Pomeroy**

Director of telecommunications public policy for the International Communications Association  
Washington, D.C.

“It’s absolutely essential in terms of the country’s competitiveness in the global economy. From the university perspective, the investigators and scientists who are working in different parts of the country often have to work together on projects.”

“Because of the sophistication of the applications that they’re using, they are requiring greater and greater bandwidth to make that relationship work effectively. That is really pushing the envelope in terms of speeds. That’s why a gigabit network is necessary.”

**Steven Relyea**

Vice-chancellor of business affairs  
University of California  
at San Diego

Software licensing practices				
Comparison of selected vendors’ net licensing				
Company	License type*	Software lockout	Multisuser discount	Portable or home use
Aldus Corp.	Machine or individual	No	19%	Yes
Autodesk, Inc.	Individual or concurrent	Yes	None	No
Borland International, Inc.	Concurrent	Yes	32% to 80%	Yes
Clarls Corp.	Individual or concurrent	No	None	Yes
Lotus Development Corp.	Machine or concurrent	Varies	3% to 19%	Varies
Microsoft Corp.	Individual or concurrent	No	14% to 33%	Yes
Nantucket Corp.	Individual	No	None	Yes
Software Publishing Corp.	Concurrent	Yes	11% to 24%	No
Symantec Corp.	Concurrent	No	12% to 52%	No
WordPerfect Corp.	Concurrent	No	41%	Yes
Wordstar International, Inc.	Machine	No	Up to 65%	No

\* Users are automatically locked out once the maximum number allowed by the license is reached.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: SOFTWARE PUBLISHERS ASSOCIATION, WASHINGTON, D.C.

## Vendors forced to examine software licensing process

Increased dependency on nets requires flexibility.

**By Bob Brown**  
Senior Editor

WASHINGTON, D.C. — Management’s call for more flexible network software licensing options has forced vendors to reexamine their practices, according to a new study.

Managing software to ensure end users are staying within license terms and keeping track of program versions and upgrades is becoming more challenging as local-area networks proliferate and more employees work away from the office.

“As networks spread, [there is an increase in] the management complexity and the opportunities for users to share software not strictly according to licenses,” said Dave Tremblay, research director for the Software Publishers Association (SPA), an industry trade group that conducted the survey. “But a lot of network managers want to stay legal, so we’re trying to help them.”

SPA interviewed Lotus Development Corp., Microsoft Corp. and 10 other major software companies for its second annual Network License Survey, which summarizes vendor licensing, bundling and pricing practices. The study is intended to help managers better understand software licensing and assist vendors in keeping track of competitors’ practices.

According to Tremblay, one of the major findings in the survey was that eight of the 12 vendors

interviewed were reviewing licensing practices, which is an indication that vendors are changing licensing strategies to keep pace with shifting user needs (see “CA offers customers new pricing options,” page 21).

The survey examined three types of personal computer software licensing: to the individual, to the PC and concurrent use. The first two include software that is licensed to specific users or PCs.

Concurrent use refers to a license that is in line with the resource-sharing characteristics of networks and that enables multiple users to utilize a program simultaneously, Tremblay said. More vendors are implementing and emphasizing concurrent licensing schemes, he added.

Although users value the flexibility of concurrent licenses, they rue the complexity of managing them. Vendors have responded to users’ pleas for management simplification by providing a lockout system that prohibits new users from accessing the software once the maximum number of users has logged on.

While there is no industry standard for network software licensing, the existence of a source summarizing the various vendors’ practices at least keeps them all abreast of the industry norm and any emerging trends so that de facto standards can be nurtured, Tremblay said.

To obtain a copy of the survey, call (202) 452-1600. □

## Net mgmt. traffic can sap net performance

The appropriate polling interval provides adequate monitoring without adding a heavy network load.

**By Wayne Eckerson**  
Senior Editor

As the number of managed devices on corporate networks grows, some companies may discover that their net management systems are causing more problems than they are alleviating.

That may be because most net management systems today — especially those employing the Simple Network Management Protocol — rely heavily on polling. If the polling interval is small and there are hundreds of devices to monitor, polling can eat up considerable network bandwidth.

“As companies evolve LANs into WANs and add remote offices to their networks, their [polling-based] management systems will chew up bandwidth and degrade response times,” said Paul Siegert, president of D-Tech Group, a systems integrator and maker of net management systems in Tulsa, Okla.

The simple solution is for companies to set the polling interval at a frequency that pro-

vides adequate monitoring and puts the least load on the network. To find that balance, firms must weigh available bandwidth against the frequency with which each device should be polled in order to detect problems before they cause a serious outage.

For example, National Semiconductor Corp. found it was not detecting problems on its large Ethernet network until five minutes after they occurred. That was because the polling interval of its SNMP-based net management system was set at five minutes, according to Abdul Wahid, a network planning consultant at the semiconductor maker.

However, when National changed its polling interval to one second, users began complaining of slow response times. As a compromise, the firm is planning to set the interval at 30 seconds. It is also looking to replace its Ethernet with a Fiber Distributed Data Interface-based network, which will make more

(continued on page 26)

## EXECUTIVE BRIEFS

BY WAYNE ECKERSON

**Outsourcing guide available.** The Information Technology Association of America (ITAA), formerly known as the Association of Data Processing Service Organizations, is offering a free guide on outsourcing. “Outsourcing in the 90s” explains how to evaluate outsourcing and get the most from an outsourcing deal. To obtain the guide, call Sophia Veney at (703) 284-5333.

**The small business LAN.** Ansel Communications recently announced a local-area network kit for small businesses that is easy to install. The firm’s Ethernet LAN package contains Novell, Inc.’s NetWare Lite peer-to-peer operating system, 16-bit Ethernet LAN interfaces, cabling and an instructional video. The kits are designed for offices with two to 25 personal computers.

The starter kit, which sells for \$599, contains the equipment needed to connect two PCs. A second kit enables offices to add PCs to the network at a cost of \$299 per PC. A third kit enables offices to connect portable PCs to the network at \$399 per PC.

According to company officials, users only need to insert one disk and hook up the cables in order to install the net. Ansel Communications also provides a 24-hour technical support hot line. For more details, call (408) 452-5041. □



## Traffic can sap net performance

*continued from page 25*  
bandwidth available for monitoring the net, Wahid said.

Other net managers would rather not poll net devices. They want vendors to boost the intelligence of management agents so the agents can send alarms — known as "traps" in the SNMP world — whenever errors occur.

Harris Corp. would like to use SNMP traps to monitor network errors and rely on polling only to gather statistics for monthly reports, according to Jim Odom, network manager at the company. Ideally, Harris would like to poll network devices just once a day, he said.

However, the problem is that not all hardware vendors have implemented robust traps. Odom said he would like vendors to develop traps that can detect a greater number of errors and alert the management system if downstream devices are failing.

Until more vendors beef up their SNMP traps, Harris will poll devices about every five or 10 minutes, depending on the type of device and its network location, Odom said. Devices on low-speed lines in Malaysia, for exam-

ple, will be polled less often than those elsewhere on T-1 links.

According to Siegerist, however, not everyone is comfortable using traps.

"People want to see gauges going up and down rather than a blank screen that changes only when an alarm goes off," he said. "It gives them the feeling that they are managing the net."

## Devices might not transmit SNMP traps until just before the network crashes.



Some users claim that traps are untrustworthy. Brad Passwaters, systems administrator for the Southeastern University Research Association Network, a regional National Science Foundation network, said devices might not transmit SNMP traps until just before the network crashes. As a result, the traps may never reach the management station to alert the operator of a

problem.

In addition, if users set the threshold for triggering traps too low, a small error might flood the network with traps, creating a network overload, Odom said.

A better alternative, Passwaters said, is to deploy a distributed polling architecture. In this setup, the net management system polls a single agent on multiple subnetworks instead of every device on the network. The agents, in turn, poll every device on their subnetworks, collecting statistics and alarm information. The agents then send this data to the net management host every time they are polled.

Passwaters said this not only reduces the load on the network, but also avoids the problem of developing management systems for large networks that can poll and process information for tens of thousands of queries in a short period of time.

These problems become significant for companies trying to expand a 10M bit/sec local-area network into a wide-area network, where the top net speed is 1.54M bit/sec. It also becomes a problem for firms running low-speed tail circuits to support a growing number of users working in remote offices or at home. ■

## People & Positions

*continued from page 23*

ing, marketing and sales worldwide. Previously, Gardner was vice-president of marketing and sales at Ungermann-Bass, Inc.

**Dennis Foster** was named senior vice-president of operations for Sprint Corp.'s Local Telecommunications Division, effective last week.

Previously, Foster was president of GTE Mobile Communications in Atlanta. Foster replaces **Fred Lawrence**, who recently became president and chief executive officer of Sprint's **United Telephone Company of Florida, Inc.**

**Michael Sauer** has been named director of international relations at **World Communications, Inc. (WorldCom)**, a New York-based international carrier. Previously, Sauer was director of switched services marketing at WorldCom. He succeeds Richard Brolly, who left to pursue other interests.

**Octocom Systems, Inc.**, a Chelmsford, Mass., maker of modems, access products and net-

work management systems, has named **James Norrod** president and chief executive officer. He will be responsible for the company's day-to-day operations and will report to the board of directors.

He replaces **Ian Davison**, who resigned as president and CEO, but will continue to serve as chairman of the board. Previously, Norrod was president and CEO of Emerald Systems Corp.

**Cable & Wireless Communications, Inc.** has named **George Vinall** director of government affairs.

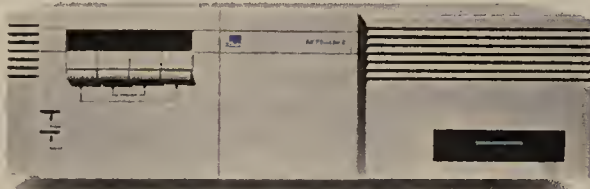
He will be responsible for the federal legislative and regulatory affairs programs at Cable & Wireless.

Previously, Vinall was vice-president of regulatory affairs for International Telecharge, Inc.

**Douglass Ebsteyne**, formerly vice-president of sales and marketing at Digital Systems International, Inc., has joined **Davox Corp.** as senior vice-president of marketing and sales. He will be responsible for developing and managing Davox's corporate strategies and marketing programs as well as direct-sales activities. ■

# Introducing NETBuilder combination of power,

Imagine upgrading your network by adding boards to a bridge/router you need never turn off. Imagine your data moving rapidly across your LAN or WAN without bottlenecking, thanks



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to the muscle of a RISC processor. And imagine, too, a bandwidth capability wide enough to handle the bulge of multimedia data.

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## Users try to thwart 800 delay

*continued from page 19*

cannot switch carriers and keep the same 800 number. However, the major local carriers have been working for several years to develop database technology and install the necessary signaling systems that will let users switch 800 numbers among carriers.

Users say they are frustrated because implementation of portable 800 numbers is a moving target. They say it is almost impossible to do network planning for 800 services because they do not know when numbers will become portable or what level of service quality they will receive.

Users told the FCC in filings last month that they negotiated a compromise on 800 portability in good faith and they believed the carriers would stick to their commitments. Now they are skeptical about the carriers' intentions.

Users unanimously agreed that the carriers have not proven the need for waivers and urged the FCC not to give in without greater scrutiny of the requests. "For the most part, the carriers support their waiver requests with broad generalities or, where specific statements have been

made, without adequate factual support," said National Data Corp., which has been heavily involved in the 800-portability dispute.

All of the users who filed with the FCC said the carriers' implementation plans for portable 800 numbers were missing significant information. For example, the carriers omitted pertinent information about how their calculations were done, whether the figures were based on average or peak network traffic loads and which service areas will be most affected by the inability to meet the FCC requirements.

Without this information, it is impossible to decide whether the carriers should be granted waivers and what customers should do to prepare, users said in their filings. "Individual customers will be affected differently, and with this information, they can take the steps needed to avoid some costs associated with the LECs' degradation of service," the International Communications Association (ICA) said in a filing.

For example, in service areas where the carriers cannot meet FCC performance requirements, customers must begin working now to modify or purchase equipment to compensate for the

shortcomings, the ICA said.

Since the carriers say they cannot meet the FCC's requirements, users are left with only two choices, neither of which they like. The carriers "effectively assert that the commission and 800-service customers must accept further degraded service or delay 800-number portability," the Ad Hoc Committee said.

The reason is that in order to support portable numbers, the local carriers must install new database technology and Common Channel Signaling System 7 on a widespread basis. Without this, the time it takes to determine where an 800 number should be routed could quadruple from the current two to three seconds.

This not only would cost corporations business from impatient customers who hang up, but it also increases network charges and could cause problems with equipment such as point-of-sale terminals that are programmed to hang up if a connection is not made within a specified time.

Another concern is that all carriers must proceed on a similar schedule to ensure nationwide availability of 800 portability. However, the carriers' implementation plans and waiver requests show little uniformity. ■

## COS, Bellcore want net of dreams

*continued from page 19*

tain switches with National ISDN 1-compatible software. AT&T, MCI Communications Corp., Sprint Corp. and Bell Canada will link the switches to create a permanent transcontinental ISDN net.

The multivendor network will comprise 24 central office switches made by AT&T Network Systems, Northern Telecom, Inc. and Siemens Stromberg-Carlson, Aloia said.

Bell Atlantic Corp., which will operate the TRIP '92 node here, will soon receive the National ISDN 1 software for the DMS-100 central office switch from Northern Telecom, he said. AT&T and Siemens are expected to supply

local telephone companies with National ISDN 1 software in the near future.

According to Aloia, the majority of the project users will show implementations based on a National ISDN 1 infrastructure. The remainder, he explained, will show applications that use pre-National ISDN 1 equipment and services.

Leslie Fraser, director of strategic programs for COS, said the planned applications will include telecommuting, local-area network interconnection, screen sharing and videoconferencing.

"If everything goes as planned, we'll consider TRIP '92 a success," she added. ■

## Start-up to provide gear

*continued from page 23*

Premisys because it had too many hardware people and not enough software personnel.

However, another source familiar with Premisys who also requested anonymity said the start-up has a promising future.

"The carriers are encouraging

users to bring in their voice, private-line, packet and switched traffic over a single T-1 access pipe," the source said. "As carriers give users more incentive to do that, there will be a requirement on the customer premises for low-cost access muxes."

Initially, Teleos is likely to provide Premisys with the most competition in this emerging market, he added. ■

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## WIRELESS LANS

BY RUSSELL SHARER

# New IEEE standards effort is doomed to fail

The effort under way by the IEEE 802.11 working group for a wireless local-area network standard is doomed to fail because it is not addressing users' needs. Instead, it's a perfect illustration of the old saying, "The beautiful thing about standards is there are so many."

The 802.11 working group believes users require a completely new standard that addresses a new set of physical and data link layer issues. The group should instead focus its effort on amending the current Ethernet and token-ring standards to simply add radio frequency as a media option so carrier-sense multiple access with collision detection and token passing could be used over the airwaves instead of on a wire. Building on the huge installed base of Ethernet and token-ring LANs would give wireless technology a great deal of acceptance from users because adding wireless options to Ethernet and token ring will enable existing Ethernet and token-ring boards to plug in to a transmitter. In addition, new nodes could be added to the network without changing hubs or bridges.

Currently, the largest barrier to the acceptance of wireless technology is value. Users need to justify the cost of migrating from their current technology — the pivotal element for the acceptance of any technology. Users that implement wireless nets based on the 802.11 standard cannot afford to throw away the equipment they've already purchased. Businesses no longer have the money or patience to endure "forklift" upgrades unless the benefits of the new technology are outstanding.

Wireless LANs, however, do have a place in the market. They will play a niche role in certain vertical industries, such as retail. According to various market research, these niche applications will not exceed 5% of the personal computer LAN market in the foreseeable future. However, if the 802.11 working group were to define a standard compatible with Ethernet or token ring, wireless LANs would find much wider application — namely, filling a mainstream need — by connecting laptops, notebook computers and personal productivity aids to existing networks.

Imagine a scenario where wireless LAN technology allows these systems to travel throughout a building or campus and remain connected to the LAN. Meetings could be enhanced and probably shortened because data could be accessed via a notebook computer from servers on the enterprise network. In this situation, wireless technology could be more useful as well as more cost-effective.

Enhancing existing standards has already proven to be a successful approach to the introduction of new technology. For example, four years ago, research consistently reported that token ring would soon overtake Ethernet in market share. But the 10Base-T standard changed that prediction. Forecasts from International Data Corp. and Dataquest, Inc. now show that Ethernet will maintain its leadership role until 1996. And a similar trend is starting to occur in the wireless LAN market, where products that build on current LAN technology are significantly outselling wireless offerings based on new physical link and LAN-access technologies.

The pursuit of yet another standard by the 802.11 working group is diverting money, time and energy that can be better used to solve other problems. A technology is not always a terrible thing to waste. ■

*Sharer is a principal with ImageMakers, a marketing consultancy in Santa Barbara, Calif.*

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## EDITORIAL

# Users should cast a critical eye at SNA's evolution

Industry pundits have proclaimed IBM's effort to overhaul Systems Network Architecture by rolling out Advanced Peer-to-Peer Networking (APPN) across its disparate computing platforms as the single greatest communications step the vendor has made in 10 years. But users shouldn't get caught up in the fanfare and lose sight of the fact that they will have to make trade-offs should they decide to move to the new SNA.

In this week's special SNA Update section, which begins on page 31, users from The Travelers Corp., Spiegel, Inc. and Colonial Penn Group, Inc. speak of the benefits and downsides of IBM's new master plan for distributed networks and databases, with one user labeling

IBM's recent APPN announcements "ho-hum."

Anura Guruge, the lead consultant at BBN Communications Consulting Group, raises an interesting issue in his analysis of IBM's APPN moves. Guruge applauds IBM for retooling SNA to allow 3270 traffic to mingle with APPN data on the same circuit. But users point out that IBM needs to better address the ability for 3270 and APPN data to share the same link.

While that is possible now, the chief limitation is that users still need a direct link from a downstream node, such as a cluster controller, to the host. Intermediate APPN network nodes would block 3270 traffic from getting to the host. This setup would place a burden on

network managers to maintain separate links to the host rather than use an APPN backbone.

Likewise, in his analysis of Distributed Relational Database Architecture (DRDA), IBM's blueprint for distributed databases, Kaptronix, Inc. analyst Atul Kapoor points out a major shortcoming. Kapoor says DRDA limits the ability of PC-based database management systems to use their capabilities to the fullest with client/server and transaction processing applications.

So although IBM has come a long way toward giving users what they want and need to support distributed networks, it appears IBM still has some work to do before it can trumpet any crowning achievement. ■



# OPINIONS

## MANAGEMENT ISSUES

BY VICTORIA MARNEY-PETIX

### U.S. businesses: Investing in education pays dividends

In most European countries, the business community cheerfully supports local university programs with unrestricted cash grants, sponsored professorships and generous donations of equipment, personnel and facilities. The firms are then rewarded with a pool of talented job candidates that help them ensure the economic vitality of their community as well as country.

Large as well as small businesses in the U.S. can gain the same benefits by taking immediate and decisive action to offer similar financial backing to local schools, especially for programs that churn out graduates with skills in communications technology.

First, U.S. businesses should offer unrestricted grants to local postgraduate programs. No

Businesses should also codevelop communications technology training programs and courses with local universities. Firms and coalitions should donate new or used equipment for laboratories, offer to set up and service the equipment, bestow funding for administrative assistance and development, and subsidize course development costs.

#### Filling a desperate need

Most postgraduate programs desperately need permanent lab facilities for hands-on experience. Companies can offer schools unused space in their buildings on a steady, long-term basis or even rent a lab facility for the college's use.

Firms can even send existing technical staff to the lab as soon as the equipment arrives to install, repair and maintain it. As an alternative to using their usual network support technicians, companies could hire graduates as part-time interns, which would not only help the school, but provide the firm itself with potential future employees.

Another way to improve communications technology programs is to lend a local university an experienced administrator for a few hours a week. In addition, firms can donate funds earmarked to cover the cost of developing a new course on a state-of-the-art technology. If the school has a qualified instructor, employees could brush up on the latest technology quickly.

Finally, U.S. businesses should offer some free marketing for their local schools. They can distribute brochures promoting educational programs in their usual local prospect mailings. Also, they can subsidize the postgraduate program's mailing costs by using corporate mailing facilities or provide catalogs and

flyers at local trade shows and other marketing events.

Business can even sponsor a contest, asking internal marketing staff how it could further promote the local university program and offering a prize — perhaps a non-work-related class, during work hours — for the most creative and useful idea.

Today's businesses need a plentiful supply of superbly trained employees who contin-

**N**o matter where you work, you can be sure that your local college's postgraduate programs desperately need your help.



ually polish their skills. These workers need specific training and general technical and business education that is available to them during work hours, not personal time. Without the help of U.S. businesses, these needs may never be fulfilled.

No matter where you work, you can be sure that your local college's postgraduate programs desperately need your help if they are to fill your company's need for well-trained employees. The possibilities are limitless. Find something your firm can do, and do it — now. ■

*Marney-Petix teaches networking in San Francisco Bay area university programs. Her new book, Mastering Internetworking, is available by calling Numidia Press at (800) 468-4322.*

company is too small to be part of this effort. Companies can enlist their suppliers, customers and competitors to create a coalition dedicated to fund-raising.

Likewise, firms can do simple things such as letting the chief financial officer's brother-in-law's band play for free at the annual picnic and investing the money saved in college programs that will provide better trained workers.

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## TELETOONS

BY FRANK AND TROISE

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*The good net manager accepts critical advice; the truly great one seeks it.*



## LETTERS

### Defending INTUG

Your article on the formation of the Telecommunications Council of Multinational Companies, Inc. (TelCOM) ("Group formed to convey users' needs to int'l carriers," NW, Feb. 17) reports TelCOM as stating that "INTUG has a reputation for combative relationships with carriers that TelCOM members said they want to avoid."

I'd like to make it clear that the International Telecommunications Users Group has always sought to work constructively. Its concern has been promoting the benefits of competitive markets.

To the extent that it has combated monopoly arrangements and pricing practices, INTUG has inevitably been involved in open criticism of post, telegraph and telephone administrations. Frank exchanges of views have, however, not disturbed civilized relationships.

The proof of this is that, for many years, PTT representatives have addressed INTUG Ple-

nary Meetings and cooperated in the sponsorship of social events at INTUG/ICA seminars. At one recent seminar, several international carriers were eager to participate. In fact, British Telecom offered sponsorship for our 1993 meeting in London a year in advance.

George McKendrick  
Executive director  
International  
Telecommunications  
Users Group  
London

### Don't give up on ISDN

The ordeal Jim Lux described in his column in your March 23 issue ("One user's journey into (continued on page 38)

Network World welcomes letters from its readers.

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Letters may be edited for space and clarity.



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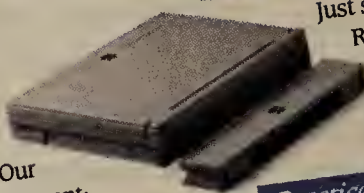
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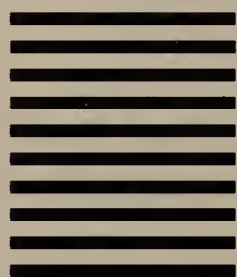
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# SNA UPDATE

## Users mixed on IBM net vision

Some sold on APPN, others either can't wait or say it is a flawed strategy.

By Salvatore Salamone  
Features Writer

Over the last year, IBM has announced a series of strategies and products to help managers of Systems Network Architecture networks flatten their hierarchical nets to become peer-to-peer in nature.

IBM's master plan is based on two major building blocks: rolling out its Advanced Peer-to-Peer Networking (APPN) technology across all its hardware platforms to ensure peer communications and allowing any device on an SNA network to access any distributed database via IBM's Distributed Relational Database Architecture (DRDA).

Some analysts have hailed the announcements, especially IBM's APPN moves in March, claiming they are "the biggest communications step IBM has made in 10 years." But users, while citing potential benefits from IBM's SNA makeover, are not as gushing in their praise.

"For us, with the very limited amount of LU 6.2 we run in our networks, this was a ho-hum announcement," says Steve Simon, telecommunications engineering project manager at The Travelers Corp. in Hartford, Conn.

*Network World* recently spoke with The Travelers, as well as SNA users Spiegel, Inc. and Colonial Penn Group, Inc., to elicit their views on how IBM is helping them evolve their nets.

The Hartford-based insurance firm's nationwide network has more than 200 4M and 16M bit/sec Token-Ring local-area networks interconnected by IBM source rout-

ing bridges. The LANs are tied into a data center that supports more than a dozen hosts that house customer records used for claims processing.

The firm also has the remnants of a terminal network, with some employees using dumb terminals attached to cluster controllers that are linked to the data center.

The Travelers' goal is to evolve fully from the terminal-based setup to a distributed peer-to-peer LAN internet, which would include peer applications so users can work locally instead of relying solely on the hosts.

APPN software in the hosts and in a slew of 3745 front-end processors (FEP) could allow The Travelers to rearchitect its net by deploying multiprotocol routers to handle the bulk of traffic routing, reducing the need for hosts and FEPs to intervene except for access to mainframe-based applications.

"That's of interest to us because the switching could really be done by bridges and routers, rather than in the [Network Control Program] on front-end processors," Simon says. "And it's much cheaper and faster that way."

This setup would allow The Travelers to eliminate current IBM subarea routing, in which traffic destined for a mainframe or LAN has to hop across one or more FEPs to reach its destination.

Products based on IBM's March announcements will "make our older SNA network more flexible," Simon says. "It will save us some pathing time set-  
(continued on page 32)



### Also inside:

■ IBM changes SNA's stripes with a healthy infusion of APPN. See page 33.

■ DRDA bodes well for nets supporting distributed applications. See page 36.



(continued from page 31)

ting up all the VTAMs, and it makes the net more dynamic."

In its current form, APPN can not recover sessions in the event of a failure in a FEP or in the links between two FEPs. "You lose all sessions when there's a failure," Simon says.

That's unlike Transmission Control Protocol/Internet Protocol-based nets that support the Open Shortest Path First routing protocol. Those LAN internets keep sessions alive by routing traffic to an alternate path in the event of a problem.

Simon, like many net managers, knows that the March announcements are just the beginning of IBM's plans. "A number of years from now, when IBM enhances its LU 2 support, they could potentially make it so we could go directly from a workstation to a host application without being routed around in a subarea network," he says.

In today's environment, you can only enter into the subarea network through one FEP running NCP. From that FEP, you can be routed to any other FEP in the network. "But you always have to do one NCP hop, and usually, multiple hops to get where you want to go in a large network like ours," Simon says.

A large number (some analysts say as much as 90%) of SNA transactions and applications are of the 3270 terminal type that rely on LU 2 sessions. As IBM lays out its APPN strategy, users — including Simon — have become concerned about the future viability of those applications. Some speculate that IBM will encapsulate LU 2 and other logical unit session types within LU 6.2 sessions.

By doing that, a user will be able to go from a workstation to a local directory to determine the location of an application it needs to get to and establish a direct session with that application. "In other words, no more subarea switching," Simon says.

Enhanced LU 2 support is expected later this year or in early 1993.

Even with this support in the future, users will still have to

contend with other issues. "Where do you do that LU 2-to-LU 6.2 conversion?" Simon asked.

"If you're using a PS/2 with unlimited memory, it's great. But if you're on an [IBM PC] XT, it's not."

Simon notes there are plenty of old devices out there as well as new ones. "Remember, what they are converting for us is our old SNA networks, which means we tend to be converting older equipment."

High memory overhead for an LU 2-to-LU 6.2 conversion could force users such as The Travelers to migrate to newer equipment, a costly proposition that Simon would like to avoid.

So The Travelers is looking to do the conversion where the cost would be the lowest. "That place might not be in the workstation," Simon says. IBM is providing a 3174-type solution for LU 2-to-LU 6.2 conversions.

"I suspect that over time we will evolve to APPN as IBM provides a migration path to it. That seems reasonable for The Travelers," Simon says.

#### Spiegel's database needs

One user evaluating IBM's DRDA is Spiegel of Oak Brook, Ill. The catalog retailer has not pursued distributed DB2, but has plans to do so in order to support a migration away from purely host-based applications.

Spiegel runs a 20-location nationwide SNA net with about 4,000 terminals, the bulk of which are 3270-type devices. Terminals at remote sites are linked to cluster controllers, which tie into the company's suburban Chicago data center via fractional T-1, microwave and fiber connections.

In 1990, Spiegel replaced a point-to-point analog modem network with AT&T's fractional T-1 service and Newbridge Networks, Inc. 3600 MainStreet T-1 multiplexers that support fractional T-1.

The network became operational in time for the 1990 peak holiday season and handled the high transaction demands that were generated during that time. The net provides connections between Spiegel's order centers throughout the U. S. and to the corporate data center in Westmont, Ill.

Spiegel uses Newbridge 3600 MainStreet T-1 muxs and the 4605 MainStreet Network Manager. The 4605 MainStreet Network-Station is based on the OS/2 operating system and uses the 5605 MainStreet NV Integrator to provide an interface to IBM's NetView as well as interfaces to control other vendors'

equipment.

The network uses Newbridge 3612 MainStreet Narrowband Multiplexers as backup systems, with switched 56K bit/sec services to ensure uninterrupted service to Spiegel's customers in the event of a catastrophic failure in the network.

The company hasn't decided at this point in time if it will be using IBM's APPN products. Spiegel plans to set up a test bed Token-Ring connection into its host in the next two months. It will use the Token Ring to explore development of LAN-based applications, which the company hopes to move to eventually.

**“The problem with DRDA is that it's not fully transparent in some environments, such as VSAM and [an integrated data management system.]”**

▲▲▲

"Client/server applications are our next challenge," says David Beulke, senior software specialist in Spiegel's systems support group.

But Spiegel is waiting to see what fleshes out with DRDA. It is waiting for IBM to deliver Distributed Database Connection Services and other products that support DRDA. Once available, products based on DRDA will allow read-and-write access to mainframe host databases and will provide extended services to OS/2 client workstations.

"This will buy the user transparent access to DB2 data from an OS/2 environment," Beulke explains. Spiegel plans to use IBM OS/2 Data Manager on the desktop to link directly to DB2.

Spiegel is not alone in its wait-and-see attitude toward DRDA. Currently, there is little use of distributed DB2. According to a survey conducted late last year by SNA software house Candle Corp., the distributed features within DB2 are not being used fully. However, many companies — including Spiegel — may plan to distribute capabilities in the future.

About one-fifth of the 545 DB2 users in the survey used distributed features. The survey found that users are waiting for DRDA because products based on DRDA will offer transparent access to DB2. This just drives home the fact that even though DRDA garnered a large amount of publicity and developers are endorsing it, users — Spiegel included — may not need it as

much or as quickly as the analysts and experts would lead you to believe.

Spiegel is even considering using Micro Decisionware, Inc.'s database front-end application in its network because DRDA lacks some of the features Spiegel needs.

"The problem with DRDA is that it's not fully transparent in some environments, such as VSAM and [an integrated data management system]" Beulke says. "It's cumbersome because if you put in access to one platform, access to the other platforms is left hanging."

Under DRDA, for instance, de-

velopers must hand code routines when developing applications. The lack of DRDA development tools increases development costs and the probability of programming and interoperability problems.

#### Not waiting for IBM

Like Spiegel, other users have decided to evolve their nets without waiting for IBM to refocus SNA. Colonial Penn of Valley Forge, Pa., has upgraded its net without the benefits of the recent IBM announcements.

Previously, the company supported IBM 3191 terminals tied to cluster controllers, which were linked via local FEPs to the corporate data center over 56K bit/sec links.

The company has been evolving its network from a traditional SNA-based net where remote FEPs passed terminal traffic to host processors at its data center to a network where remote 3191 terminals connect to IBM 3174 cluster controllers on 16M bit/sec Token-Ring LANs.

Those remote sites are bridged back to the corporate data center via Andrew Corp. remote bridges.

Today, Colonial Penn has Token Rings in Phoenix, Irvine, Calif. and Tampa, Fla., in addition to three in the Philadelphia area. They've basically replaced a dumb terminal network with a series of Token Rings. The company has done all of this without waiting for IBM.

"We are not dependent on IBM for this," says Steve Clevenger, vice-president of data operations at Colonial Penn. "For example, we eliminated the remote 3720 front-end processors and the 3745s."

The goal, he says, is to cut response time to remote terminal users. This is accomplished by going directly from one LAN to another without having to pass through the host, which was required for all traffic under the old setup. Now a user in Tampa can send a message to a user in Phoenix via a bridge on the Tampa Token-Ring LAN and over a fractional T-1 line to another bridge on the Phoenix Token-Ring LAN to a local user there.

The new network provides users with access to claims processing, policy holder services and telemarketing applications running on an IBM 3090 mainframe in the company's Valley Forge data center.

In addition, the net provides users working on personal computer-based nodes on the Token-Ring LANs with peer access to one another. This allows users to

(continued on page 38)









(continued from page 33)

tween dispersed remote locations through a host. These interactions can be supported over existing communications links and with only minor changes to front-end processor-based Network Control Program (NCP) software.

In hierarchical SNA networks, host intervention is required to establish connections between network devices or applications. Therefore, most large SNA networks evolved into hub-and-spoke topologies, with the host acting as the hub. Remote locations would typically have communications links only to a central host rather than point-to-point links to one another.

Because APPN can utilize existing links, adding APPN to hosts enables users to exploit peer-to-peer networking over their current hub-and-spoke SNA network. Without APPN on a host, users may need to invest in a new physical network to provide point-to-point links between APPN nodes.

Obviously, as users adopt new wide-area network technology, such as cell relay, or inexorably move toward multiprotocol inter-networking, they may elect to install direct links between remote locations. With APPN support being added to hosts, APPN applications will also be able to migrate to the new network topologies.

IBM is also providing help to customers that intend to slowly but surely move away from an SNA/APPN-only backbone to a heterogeneous, multiprotocol one, where APPN traffic coexists alongside Apple's AppleTalk, Digital Equipment Corp.'s DECnet, IPX, IBM's Network Basic I/O System, Open Systems Interconnection, TCP/IP and Xerox Corp.'s Xerox Network Systems traffic.

IBM announced in March that APPN network node capability will be available on its 6611 multiprotocol bridge/router early next year. Additionally, IBM promised to license the APPN network node so other vendors can make it available on their bridges and routers.

### The 3270/LU 6.2 union

The host-independent, peer-orientation of APPN, coupled with the ability to use it on existing SNA networks and then migrate toward internetworks, makes it a very compelling networking scheme. But APPN supports only interactions that are based on SNA LU 6.2 Advanced Program-to-Program Communications protocols.

Realizing many users still employ non-LU 6.2-based applications, IBM promised that VTAM Version 4 will permit native LU 6.2/APPN and other native SNA

logical unit-to-logical unit session types — most notably, session Types 2 and 3, which are associated with the 3270 data stream — to coexist on the same circuit.

To fully appreciate the implications of having APPN and 3270 traffic sharing the same link, visualize a 3174 cluster controller that is directly connected via a leased line to a 3745 running NCP Version 6 Release 2 and through the 3745 to a host with VTAM Version 4 (see Figure 2, this page). Also, assume that the 3174 is acting as a gateway to a token-ring LAN containing PCs emulating 3270 terminals or running LU 6.2-based applications.

The 3174 can act as an APPN network node as well as continuing to be a traditional 3270 controller/gateway. The host to which the 3174 is connected has traditional 3270-based applications running on top of TSO and LU 6.2 applications running on top of CICS or VTAM. It can also be linked via the 3745 to other APPN network or end nodes, such as an AS/400, PC or other 3174 LAN gateways.

In this topology, the 3174 will serially multiplex 3270 and LU 6.2 traffic on the link to the 3745 using the standard SNA/APPN Path Control link sharing methodology that has always permitted multiple, disparate sessions to be multiplexed across the same link.

At the host, VTAM will direct the 3270 sessions to the appropriate 3270 applications and the LU 6.2 sessions to their partner LU 6.2 applications. In the case of APPN sessions, where the destination LU 6.2 application is running on another remote APPN node, VTAM Version 4 will act as an APPN network node and route that traffic over the relevant link toward its eventual destination.

What sours this picture is if another APPN network node is inserted between the 3174 and the 3745. This is perfectly acceptable to LU 6.2/APPN traffic because APPN has no limitations on how many intermediate network nodes can be placed between two

network nodes trying to communicate with each other or between a network node and an end node.

However, while LU 6.2/APPN traffic continues to flow unimpeded through an intermediary APPN network node, 3270 sessions will not be able to pass through. Instead, a separate link is needed to pass 3270 sessions directly from the 3174 to the 3745. A future release of VTAM Version 4 is expected to alleviate this limitation.

This dependency on LU 6.2 is the main gating factor to the wide-scale acceptance of APPN because users will have to standardize on LU 6.2-based applications. This is at least a few years away for most current SNA users because most customized LU 6.2 applications are still on the drawing board.

### Help arrives

IBM has provided help to users developing this next generation of LU 6.2-based SNA applications by publishing a networking blueprint that defines a series of application program interfaces (API) they can use. To be fair to IBM, the timing of its host APPN support announcement or, for that matter, its networking blueprint, was good. With workstations now ubiquitous, the time is ripe for a new generation of cooperative processing and client/server applications that fully utilize the processing, data storage and multimedia presentation capabilities of these workstations.

LU 6.2, with its transaction processing bias, which includes built-in facilities for automated transaction update error recovery, is as good a means for realizing these new client/server applications as any. IBM has further increased the ante in LU 6.2's favor with Common Programming Interface for Communications (CPI-C), IBM's strategic LU 6.2 API. CPI-C is available for MVS, VM, OS/400 and OS/2. CPI-C for DOS and AIX will be available by early next year.

LU 6.2 also has the added virtue of including a set of built-in data access and distribution utili-

ties in the form of SNA Distribution Services (SNADS), Document Interchange Architecture, Distributed Data Management (DDM) and SNA/File Services. Applications built on top of these utilities such as IBM's OfficeVision, which uses SNADS for data and mail distribution, can immediately be moved to APPN.

DDM provides transparent access to remote files or relational databases by making them appear to applications as if they were local. DDM is one of the transport mechanisms defined in IBM's Distributed Relational Database Architecture (DRDA). Since DDM/DRDA is LU 6.2 based, it fits into APPN, making APPN an obvious choice for future distributed data applications (see "DRDA will help users juggle data," page 36).

### The new blueprint and APPN

In a way, IBM's network blueprint extends the potential scope of APPN. But at the same time, it

raises, albeit somewhat obtusely, a question as to the true long-term viability of APPN.

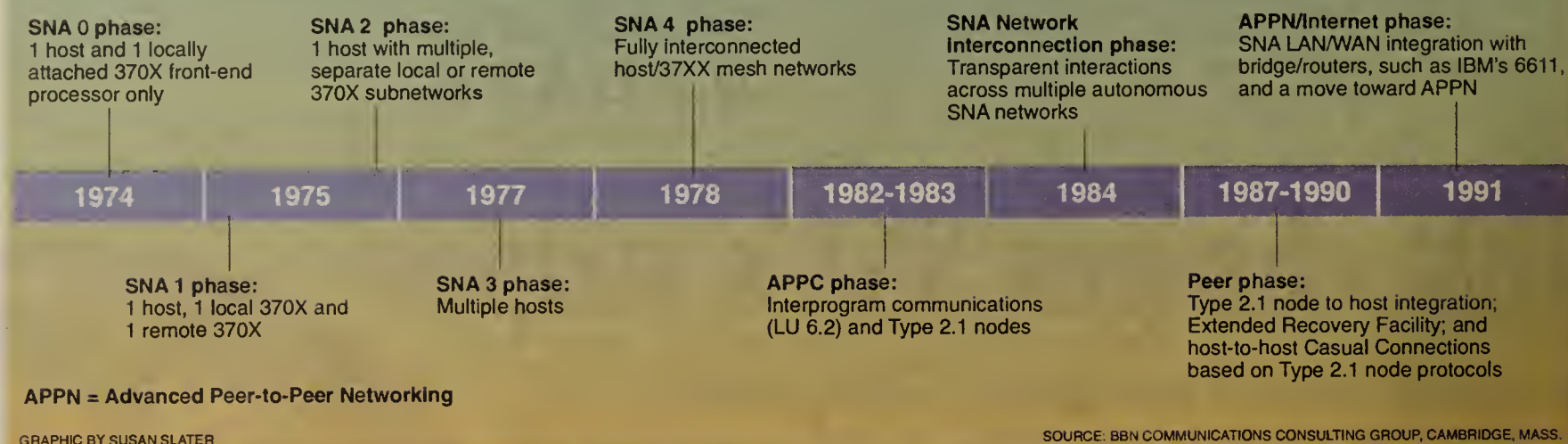
The blueprint essentially states that application developers should concentrate on selecting and using an API that best suits their needs, rather than trying to make hard-and-fast decisions as to whether the application should be deployed over SNA/APPN, TCP/IP or OSI networks.

The APIs IBM recommends in its networking blueprint include CPI-C, remote procedure calls, Message Queue Interface and Sockets.

To emphasize the possibilities, IBM has already discussed using CPI-C and Sockets to build applications running over APPN as well as TCP/IP. According to IBM, CPI-C will support OSI in the future. In this respect, users can assume that interactions originating from non-LU 6.2-based APIs will be supported across

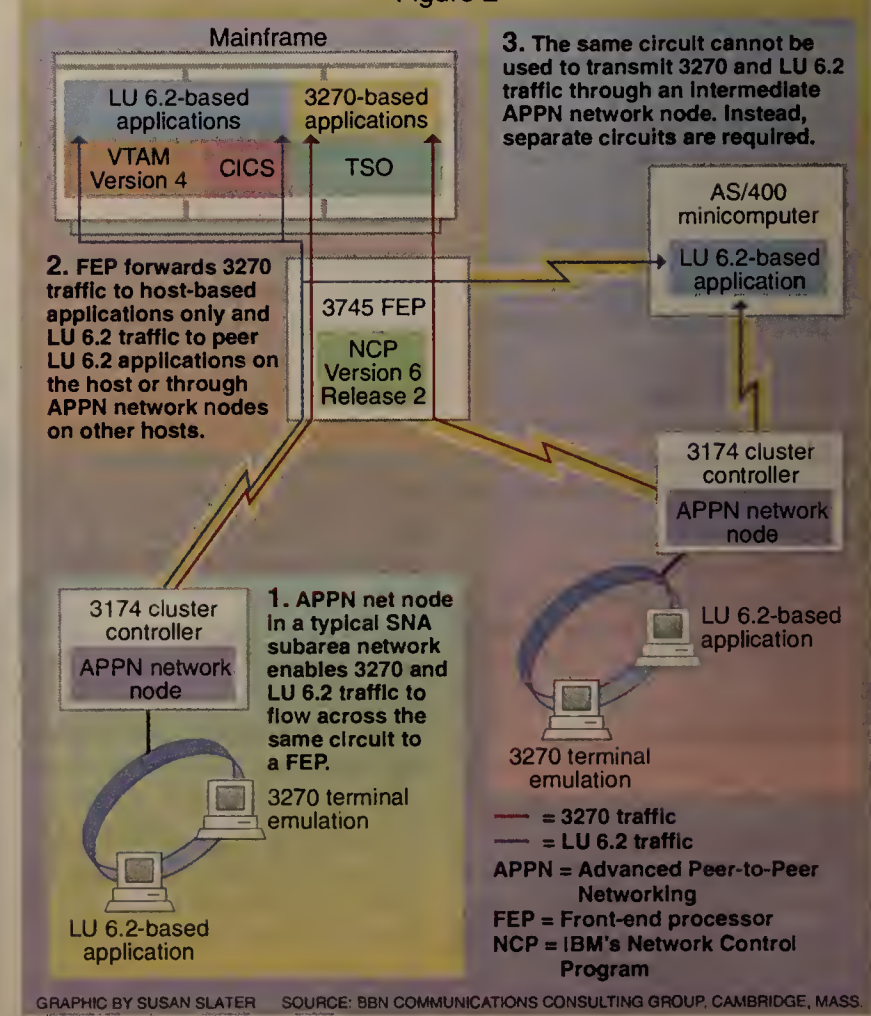
## The nine lives of SNA

Figure 1



## The APPN data stream meld

Figure 2





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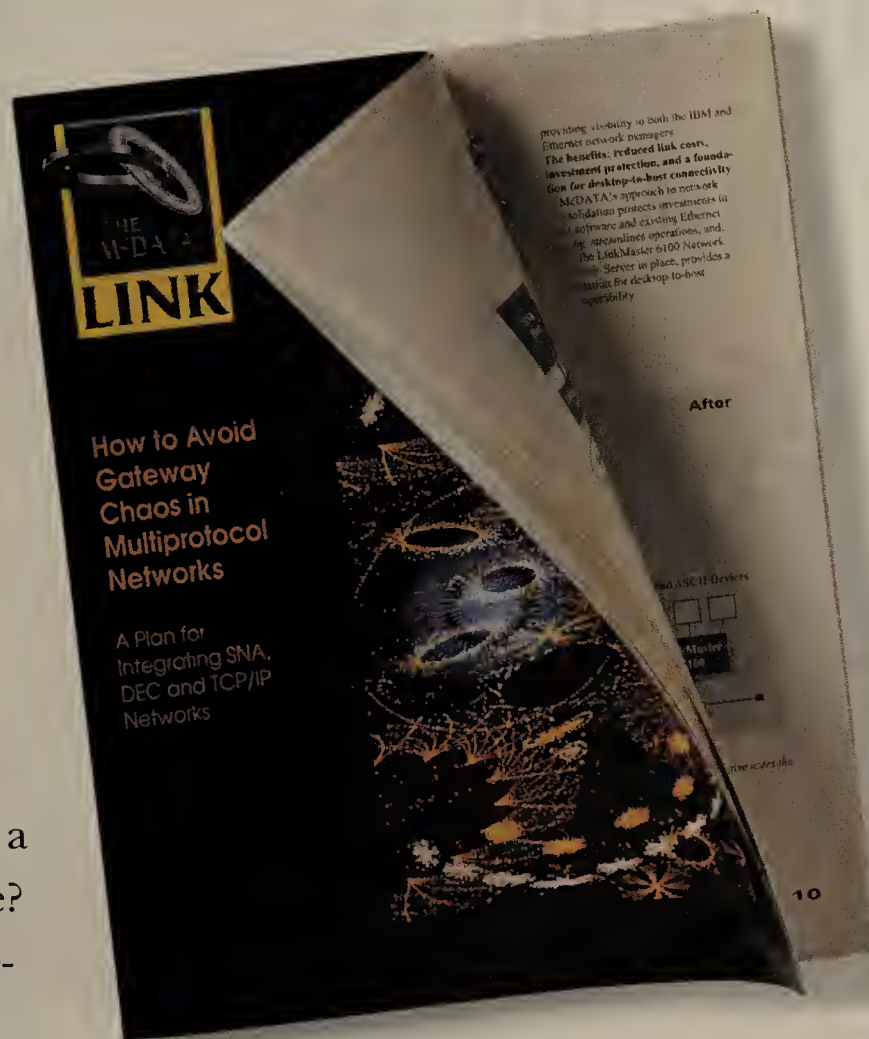


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# McDATA



# DRDA will help users juggle data

By Atul Kapoor  
Special to Network World

IBM has taken a number of recent steps to allow users to juggle data across distributed databases in their Systems Network Architecture networks.

On the network side, IBM has recast SNA by integrating LU 6.2, also known as Advanced Program-to-Program Communications, and Advanced Peer-to-Peer Networking (APPN) to provide a rich, flexible infrastructure to support client/server and distributed transaction processing applications.

But the linchpin to users' efforts to distribute information across databases in their SNA nets is IBM's Distributed Relational Database Architecture (DRDA).

Announced in June 1990, DRDA is a critical element of IBM's Systems Application Architecture (SAA) that will enable the sharing of data among applications, regardless of the location of the data or the platform on which the application runs.

Clearly, DRDA is important for users planning to develop distributed applications. Transparency of data and underlying communications protocols, commitment control to ensure data integrity and availability on a variety of platforms are some of its attractive features.

Yet while DRDA brings a number of critical functions to application programmers, it also raises a series of challenges for network managers. Network design becomes more complicated since "data on demand" creates an unpredictable model for traffic analysis.

## DRDA in a nutshell

DRDA is not a product but, rather, an architectural blueprint that suggests the use of new database protocols and interfaces between dissimilar remote relational database management systems. DRDA also defines requester/server facilities, which allow a database on one system to request and update data on another. In addition, it introduces new standards for commands, data descriptors, objects and communications.

As such, DRDA exploits the peer capabilities of APPC as well as APPN (see "APPN should drive DRDA application development," page 38).

Because DRDA provides real-time access to information independent of the data's location, it eliminates the need for duplicating

databases and problems associated with keeping data current at distributed sites. In addition, because DRDA allows access to individual records and tables anywhere in the network, it should also reduce the frequency of data batch uploads and downloads, a major problem in maintaining

net performance.

In any discussion of DRDA, it's important to emphasize the difference between the architecture and the products that implement DRDA. Not all products implement the same set of DRDA functions.

To date, DRDA functions have been implemented in IBM's DB/2 databases on MVS hosts, as well as its SQL/DS mainframe relational DBMS in a VM environment and OS/400 Database Manager. IBM has also identified a subset of DRDA that it intends to implement in its OS/2 Extended Edition Database Manager.

Furthermore, DRDA support is available under popular IBM transaction managers such as CICS and IMS. IBM has also made a statement of direction to implement DRDA in the AIX operating system.

As a consequence, network managers should be able to deploy a single network, interconnecting local- and wide-area networks to support distributed database applications running on one or more of these platforms.

## Net implications

One interesting aspect of DRDA is that IBM apparently tried to divorce its database functions from the underlying network links, enabling DRDA-based

DRDA makes distributed applications a reality, but the architecture imposes net constraints.

part of DRDA, are transparent to the application programmer. However, to provide DRDA compatibility, non-IBM products must implement not only DRDA-compatible database functions, but also the subset of LU 6.2 and DDM that is built into DRDA.

## Requester/server model

DRDA uses a requester/server model to define the relationship between applications and DBMSs. Three types of functions are defined under DRDA to describe the processing of requests between an application and a DBMS.

**Application Requester (AR)** functions are invoked by an application to request data via an SQL application program interface (API) from the relational database. The AR uses an application support protocol to initiate the request.

**Application Server (AS)** functions are used by the server to receive requests from an AR. The server is responsible for routing application requests to database servers. The AR communicates with the AS using the application support protocol.

**Database Server (DS)** functions actually access the DBMS and provide data to the AS. The AS communicates with the DS using a database support protocol.

The application support protocol and the DS protocols are transparent to the user application and actually get enveloped in a DDM stream for transmission over the network. Both the AS and DS functions may reside in a single network node.

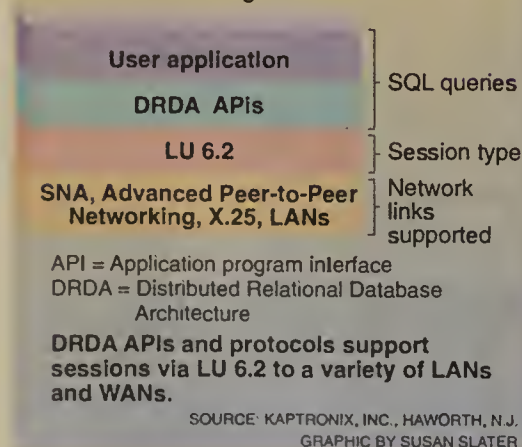
## Other required technologies

DRDA also stipulates that applications must employ several IBM technologies other than LU 6.2 to provide true distributed database sharing. DRDA specifies use of DDM, Formatted Data Object Content Architecture



## Where DRDA fits

Figure 1



DRDA is intended to be the foundation on top of which users can build true host-independent applications, where databases may be located on mainframes, minicomputers such as Application System/400s, OS/2 workstations or even on IBM AIX workstations and servers.



# DRDA's relational DBMS concepts

A fundamental element of distributed databases is the concept of a unit of work (UOW). A UOW is a set of database operations, involving one or more databases, that pertain to a single application "transaction."

A UOW can be as simple as reading a record or table from a single database or as complex as a distributed transaction involving multiple programs and databases distributed over several machines. When database updates involve remote databases, the UOW is known as either a remote or distributed UOW (RUOW).

An important requirement for UOWs is when databases are updated as a part of a UOW, either all or none of the changes associated with a UOW must be applied or committed to the databases — otherwise, the data integrity is lost.

Such an assurance is provided through the "commit" function of a DBMS. At the end of a UOW, the application makes a commit request to the DBMS. The DBMS responds by indicating that either all updates have been made or, if a failure occurred midway through the update process, that all databases have been restored to the state they were in prior to the failure — a process called backing out. This type of commitment con-

trol is also known as a single-phase commit. Commitment control is sometimes referred to as synchronizing the databases.

Based upon the type of updates and commitment control involved, application requests are divided into four classes under IBM's Distributed Relational Database Architecture (DRDA).

The simplest of the four, a remote request, consists of a single SQL statement. The request may be for a read or an update function involving a single DBMS. Each subsequent SQL statement represents a UOW, and no recovery or synchronization is necessary between SQL statements. When database updates are involved, a single-phase commit is sufficient.

Another application request form, the RUOW, may include multiple SQL statements, both reads and updates. As with remote requests, all requests are processed by a single DBMS and a single-phase commit is sufficient.

Unlike the first two types of requests, the Distributed UOW (DUOW) may include multiple SQL statements involving multiple DBMSs. A DUOW requires the use of a two-phase commit to ensure data integrity and recoverability across multiple DBMSs. In the first phase of the commit process, the DBMS broadcasts a

commit request to each process involved in the DUOW. Each process returns a yes or no reply, indicating whether it has completed the commit processing. If all processes reply with a yes, a second message is broadcast to indicate a successful commitment.

Distributed request supports a single SQL statement that may query multiple DBMSs on multiple machines. This capability also requires a two-phase commitment control.

To date, IBM has not announced support for the distributed unit of work or distributed requests under DRDA.

Another important DBMS function users need to understand is the role of the Database Directory.

The system administrator uses the DRDA naming services to define names for such things as end users, databases and tables at each DRDA location. A DRDA application deals only with symbolic names of databases and tables. DRDA maps these names into appropriate network information.

When the directory shows involvement of remote databases, DRDA sets up Advanced Program-to-Program Communications sessions with remote clients or managers to satisfy the data request.

— Atul Kapoor

such as NetWare, to access remote DRDA servers. Although LAN-attached clients can issue queries to fetch a file or a portion of data from a local or remote DBMS, any LAN database cannot handle DRDA server functions unless the user writes custom CICS code to do so.

DRDA applications use a connection-oriented model in which the two processes establish a "conversation" in order to exchange information. This model can support only one unit of work — a DBMS operation involving one transaction at a time (see "DRDA's relational DBMS concepts," this page). For this reason, it is also called a synchronous model because one unit of work must be completed before the next can be initiated.

In the current implementations of DRDA, updates of remote databases known as remote units of work (RUOW) are supported only under DB/2 on an MVS host, SQL/DS in a VM environment and OS/400 on an AS/400.

Under the statement of direction for OS/2, only a "client" function for RUOW is supported. That is, an IBM OS/2 Database Manager application can request a RUOW at DB/2, SQL/DS or OS/400 databases but cannot be the target of a RUOW request itself.

Since early DRDA implementations — such as in DB/2, OS/400 and OS/2 Database Manager environments — are available only with IBM products, early applications of DRDA will naturally emerge in IBM-dominant environments where users are committed to SAA and APPC. These environments also tend to be host-dominant.

As DRDA and APPN implementations become more complete and ubiquitous on OS/400, OS/2 and AIX, host-independent DRDA applications should become widely accepted by the mid-1990s.

DRDA applications can be de-

veloped to run on personal computers supporting OS/2, AS/400s and host computers. At the low end, DRDA applications can reside on a stand-alone workstation linked via a Synchronous Data Link Control line to the host or on a LAN-attached PC.

A DRDA-based application on any machine can fetch, or read, data from a database on any other machine with complete transparency of the data location and the underlying LU 6.2 communications functions.

In addition, an SQL application on a PC, AS/400 or a host could execute a RUOW on a single remote database residing on a mainframe or an AS/400 with full commitment control.

Applications residing on the host or the AS/400, however, cannot request a RUOW at the PC LAN level since the planned DRDA support for OS/2 includes only client functions. That means PC-based DBMSs initially are restricted to local data repositories that can react to requests for data but cannot coordinate changes across multiple DBMSs.

Users could employ CICS in place of SQL to create custom code. They could also take advantage of CICS facilities to build additional functions that are not currently available under DRDA, such as an RUOW server on the PC, and provide commitment control through CICS-provided facilities.

The process of application programming can be further eased by using IBM Cross Systems Product (CSP), which generates distributed COBOL applications for OS/2 Extended Edition and MVS. With CSP, the application programmer describes processing logic using a fourth-generation language and simply identifies the functions to be executed on the PC and the host. CSP then generates complete COBOL programs for the PC and the host. CSP can generate distributed ap-

(continued on page 38)

(FD:OCA), Character Data Representation Architecture (CDRA) and SNA Management Services Architecture (MSA).

DDM is an architected data management interface for data interchange between similar and dissimilar systems. DDM defines functions and the flow of commands that make up DRDA. For example, DDM commands are used to establish connectivity between the AR and AS, convey SQL requests from the AR to AS and receive results, as well as to terminate units of work and the connection between the AR and AS.

The single SQL statement CONNECT, for instance, used by the client to establish a connection with the server DBMS, would allocate an APPC conversation between the AR and AS.

It would also initiate the flow of DDM commands to exchange data, release levels of the AR and AS so both operate at the same level of intelligence, forward the remote database name to the server and receive a confirmation that the remote DBMS can support desired DRDA functions.

DDM is also used for data interchange involving non-DRDA databases. Thus, only a subset of

DDM applies to DRDA.

DDM also describes the content of all DRDA data objects from the AR and AS. The format of these objects is described using FD:OCA.

CDRA defines an encoding scheme for characters and character data conversions to preserve characters and their meaning. This DRDA service handles EBCDIC-to-ASCII conversions, for instance.

Finally, MSA is used to report alarms from DRDA to a management product such as IBM's NetView.

## Application considerations

The application, or user, interface to DRDA is via an SQL-based API. SQL is also the common interface for database access in SAA. The SAA SQL is common to all DRDA platforms and, therefore, should simplify the porting of DRDA applications to any platform that supports DRDA.

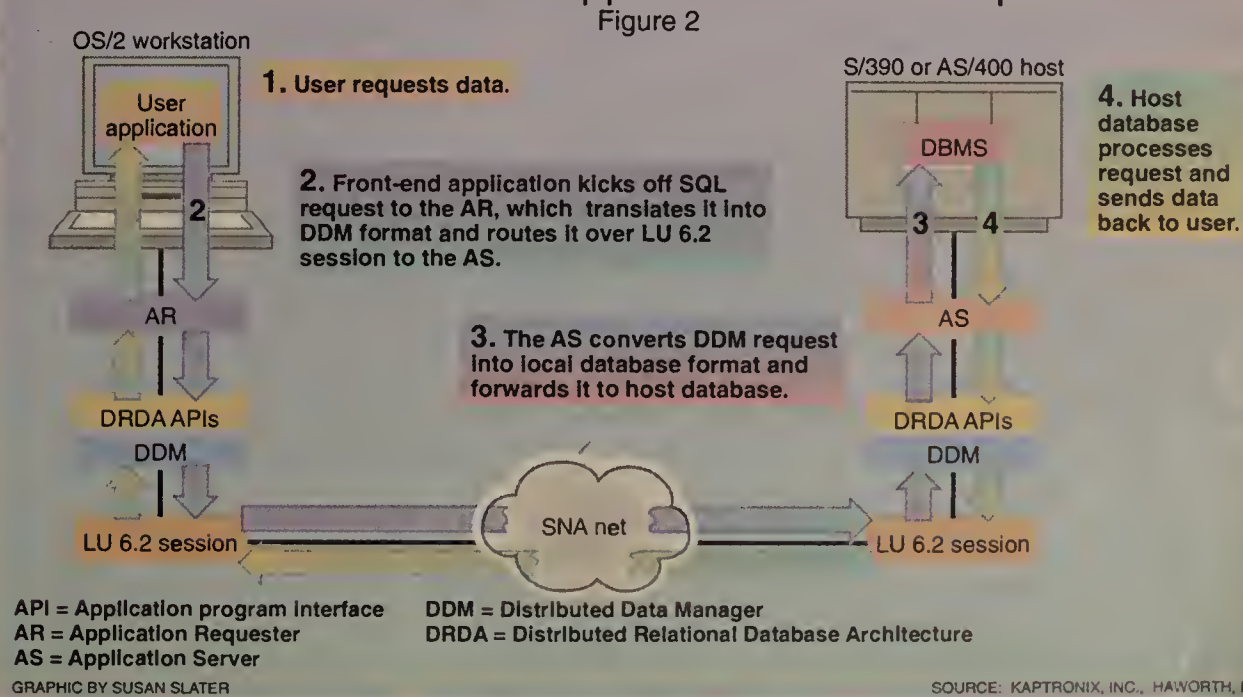
However, it does not support popular LAN protocols such as IBM's Network Basic I/O System or Novell, Inc.'s Internetwork Packet Exchange (IPX). Conversely, popular LAN client/server operating systems, includ-

ing IBM's OS/2 LAN Server, Novell's NetWare and Microsoft Corp.'s LAN Manager, do not support DRDA-required protocols such as DDM over LU 6.2. Consequently, none of these operating systems supports DRDA.

That means users that want to run DRDA applications on a LAN would need an operating system, such as OS/2, in addition to their existing LAN operating system,

## How DRDA-based applications handle requests

Figure 2





## DRDA will help users juggle data

*continued from page 37*

applications for SQL and CICS environments.

None of the DRDA functions for use on an OS/2-based device in the scenario above are available yet.

DRDA is important for users planning to develop distributed applications. Its transparency of data and underlying communications protocols, commitment control and wide availability make it attractive for SNA users.

But despite the advantages of DRDA, the blueprint also carries some sizable challenges inherent in any distributed database plan.

In addition, to the extent that extensive movement of batched data still exists, it would make it difficult to maintain a uniform re-

sponse time for interactive users. And one of DRDA's strengths, transparent access to data, also creates new system administration requirements because additional directories have to be defined to identify the location of various databases and tables.

On another front, the distributed unit of work, a key database function, is not included in the current DRDA specifications. Such support must be available before DRDA can be considered a well-rounded architecture.

DRDA may eventually become a significant part of new database applications, but until then, it will only be of limited assistance to users of well-entrenched LAN operating systems. ■

*Kapoor is a principal with Kaptronix, Inc., a Haworth, N.J.-based consulting firm.*

## APPN should drive DRDA application development

The availability of IBM's APPN should stimulate development of applications based on the firm's Distributed Relational Database Architecture (DRDA), its blueprint for distributing data among relational databases supported under Systems Application Architecture.

Availability of Advanced Peer-to-Peer Networking across the major SNA platforms promises to enable users to develop distributed database applications that communicate on a peer basis rather than relying solely on a host database application.

Before APPN, Systems Network Architecture sessions could only be established through a host. In addition, one of the two session partners had to be a host-resident application running on top of VTAM. Network applications also limited end users to emulating nonintelligent devices such as display terminals.

The availability of LU 6.2, also known as Advanced Program-to-Program Communications, provided some relief. With APPC, applications were no longer limited to emulating dumb devices. However, early

implementations of LU 6.2 were limited to Type 2.0 nodes, which only supported host-dependent sessions or dependent logical units.

The availability of Type 2.1 nodes, also known as Low Entry Networking (LEN), permitted host-independent sessions, or independent logical units. However, little support for LEN in

host-based VTAM residing and the front-end processor-based Network Control Program (NCP) software still limited users to a host-dominant environment.

In addition, with the recent availability of APPN support for

OS/2, OS/400, VTAM, NCP and 3174 environments, users can finally implement fully distributed applications with any-to-any connectivity, regardless of whether there is host involvement.

Thus, APPN provides a strong and prerequisite foundation for database applications based on DRDA. While DRDA provides transparency of data location, APPN provides transparency from the physical and logical network.

— Atul Kapoor

## Users mixed on IBM net vision

*continued from page 32*

share information — electronic mail and internal facsimile, for example — between remote sites by sending them across a corporate backbone on a bridged Token-Ring basis instead of routing traffic through the host. This reduces the reliance on the mainframe and on FEPs and significantly improves response time for end users.

"The initial benefit from the new network is that internal documents will no longer be mailed to different company locations, internal fax is probably a thing of the past, and with some applications — there's one with microfiche, where we currently mail hard copies of microfiche — we are going to send that over the

network." Basically, Colonial Penn would be consolidating all these applications and putting them on the single LAN internet.

The net is running some initial enterprisewide applications. For instance, it has E-mail based on WordPerfect Corp.'s Office program. "We have other applications we are looking at," Cleverger says.

The company is also in the process of developing or restructuring applications so new applications can run on any platform, he says. Most of the applications Colonial Penn is likely to develop in the short term would be for the mainframe. However, the company wants to have the option of running future applications on LANs, as well.

Colonial Penn's network evolution was driven by the company's internal networking needs,

not by IBM's statements of strategy. However, it is paying attention to IBM's moves because it will be supported if they choose that path, according to Cleverger.

### Looking ahead

For some users, IBM's APPN and DRDA announcements will prove to be networking gospel on how to evolve their particular networks.

But, as The Travelers, Spiegel and Colonial Penn have indicated, there are other users who have their own vision for how to evolve their networks and they are willing to weave IBM technology into the master plan, provided it fits their needs.

If it doesn't, those users aren't afraid to import other technologies to migrate their traditional SNA nets. ■

## IBM changes SNA's stripes

*continued from page 34*

APPN by encapsulating the interactions within LU 6.2-based sessions.

This mix-and-match philosophy between APIs at the top and network type at the bottom raises an intriguing question about the long-term future of APPN. No doubt, many customers will write CPI-C- or Sockets-based applications to run over APPN.

IBM's networking blueprint, however, postulates that it would be possible to run these same applications — most likely after a recompilation — across either TCP/IP or OSI, once appropriate transport layer mappings are available from IBM and possibly other vendors.

There is considerable interest in such transport layer mappings. In addition, fanned by the popularity of multiprotocol internet-working, open systems computing is in vogue. TCP/IP and OSI are dubbed open networking en-

vironments. SNA has successfully competed against those protocols in the past. However, until the release of this networking blueprint, IBM never admitted the possibility of running an SNA LU 6.2 application over OSI, not to mention TCP/IP. But all of this

**APPN is close to what a contemporary networking scheme should be.**

▲▲▲

is still at least four to five years down the road.

In the meantime, APPN offers a compelling migration path for users who wish to move toward either peer-oriented SNA networking or, more realistically,

bridge and router-based internet-working. APPN, ignoring its anachronistic fixed-path routing and its current overall transmission efficiencies, is close to what a contemporary networking scheme should be: a dynamic, peer-oriented, plug-and-play and configure-on-the-fly plan.

It is not that often that users get a chance to see such a spectacular metamorphosis as SNA changing into APPN. For those that can, this would be a great opportunity to start thinking about migrating to APPN and, thus, join the vanguard responsible for tearing down the hierarchical SNA wall. ■

*Guruge is lead consultant at BBN Communications Consulting Group in Cambridge, Mass. He is the author of several SNA books, including SNA Theory and Practice, published by Pergamon Infotech, Ltd. in Maidenhead, England. He can be contacted by phone at (617) 873-6049 or via MCI Mail at AGuruge.*

## Letters

*continued from page 29*

the lost continent of ISDN") is unfortunate. While his experiences are typical, I can't help but feel that he threw the baby out with the bath water in discounting Integrated Services Digital Network as a data communications solution.

Basic Rate Interface (BRI) ISDN is available now at attractive prices, but potential users need to understand the limitations of the service and service providers.

In addition, Bell Communications Research's Special Report SW-NWT-2102 provides information on when ISDN capability will

be available in each central office. Company training programs are starting to pay dividends, and lack of information should cease to be a problem.

Switch incompatibilities will be resolved this year with AT&T's 5E6 and Northern Telecom, Inc.'s BCS 34 software loads providing compliance with the National ISDN 1 standard.

Universal availability remains a problem, as the column points out. However, Pacific Bell, in particular, has addressed the issue in interworking between ISDN and its Switched 56 and Public Packet services. Pacific Bell has made a major commitment to ISDN, increasing its number of lines with access to ISDN from 4.1 million

(30%) in 1992 to 7.5 million (50%) in 1994.

Many terminal adapters in the \$500-to-\$600 range are available. While this is higher than a V.32/V.42bis modem, ISDN provides voice support as well as data. In addition, both B channels on a BRI can be aggregated into a 128K bit/sec pipe. With Lux's application (an industrial properties database), ISDN provides sufficient bandwidth to integrate high-resolution graphics, voice and even full-motion video into a multimedia database.

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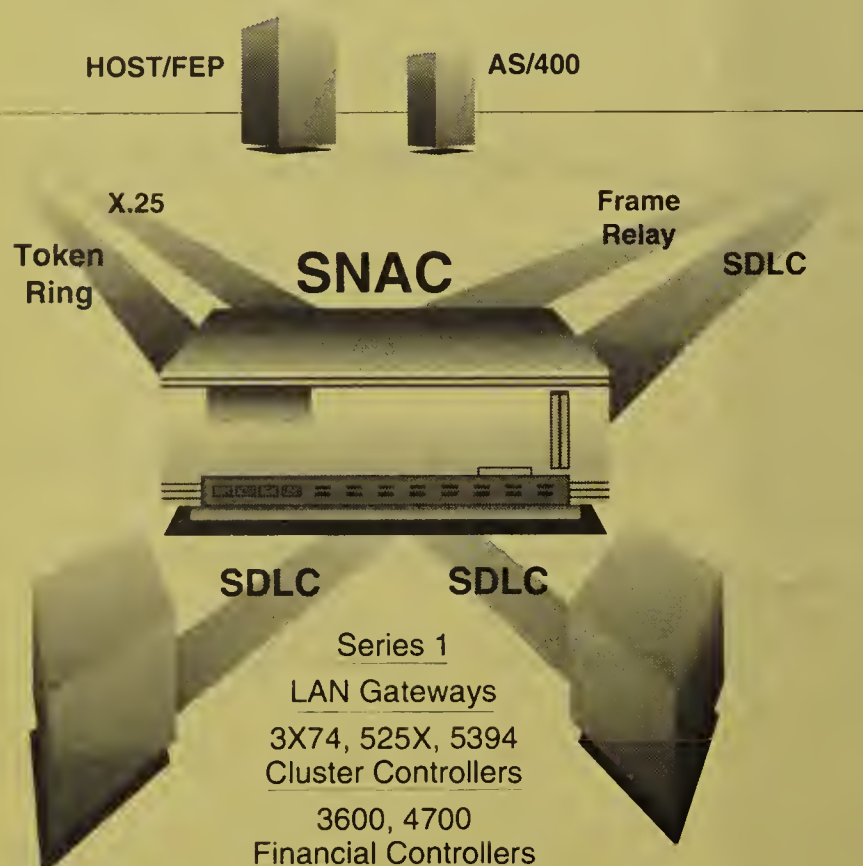
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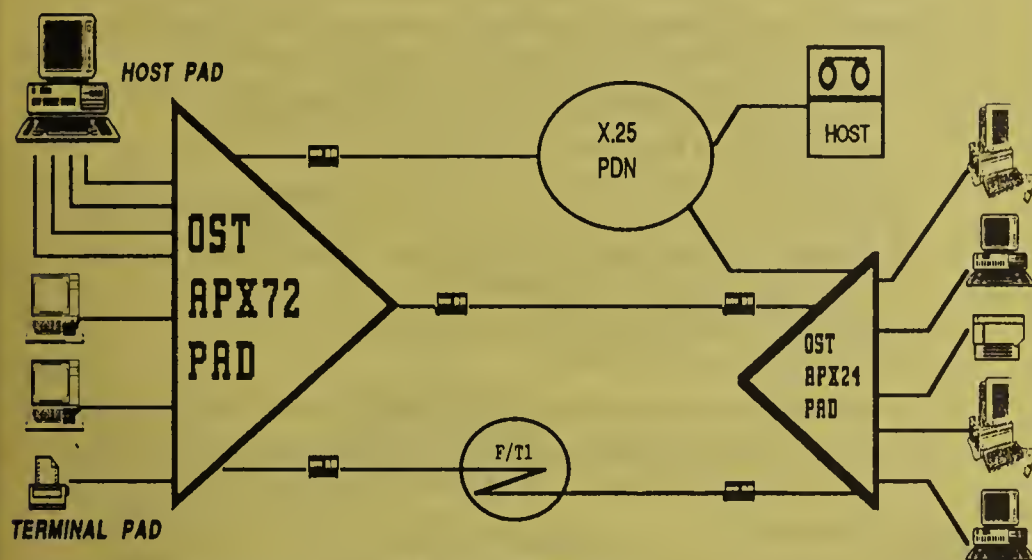
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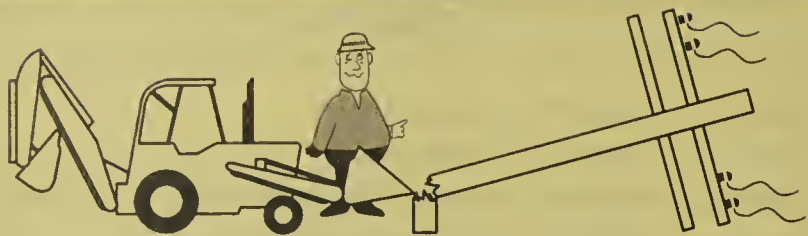
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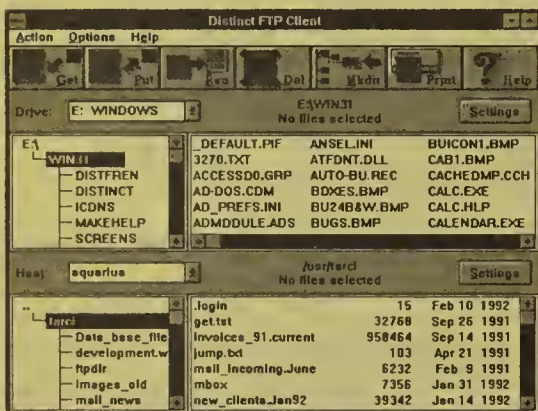
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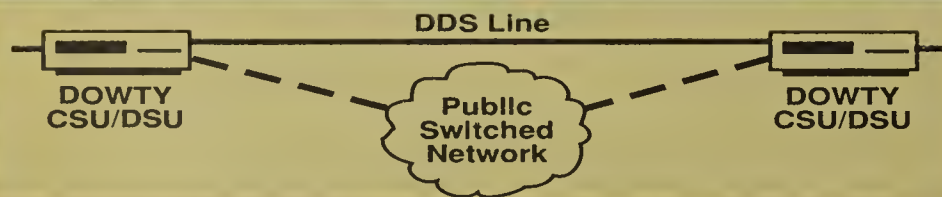
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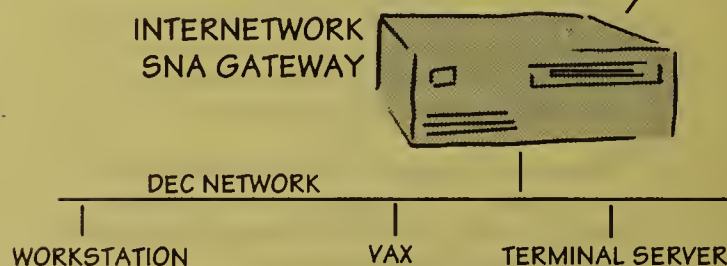
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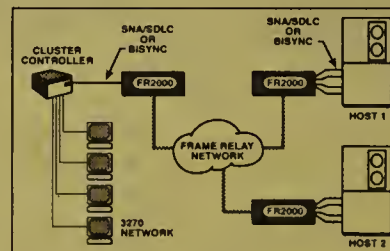
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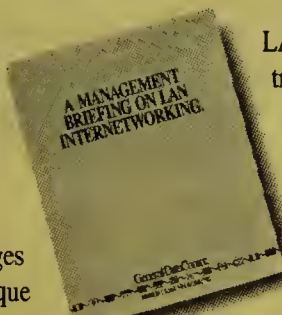
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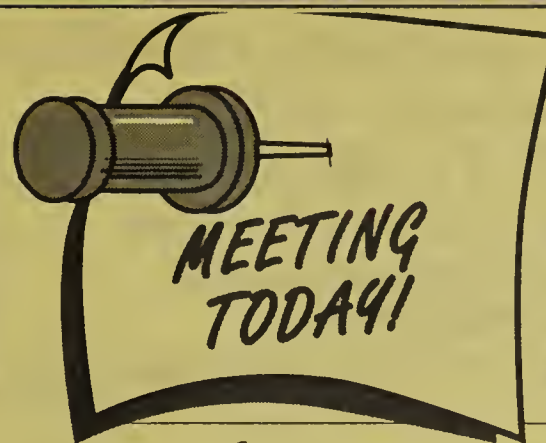
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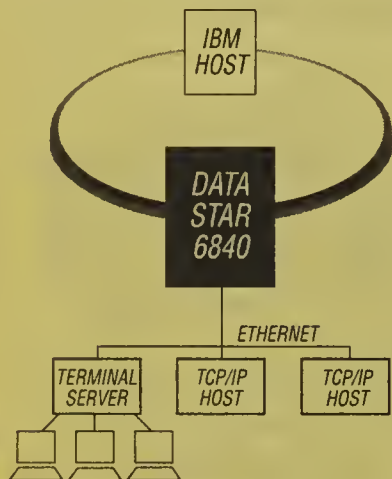
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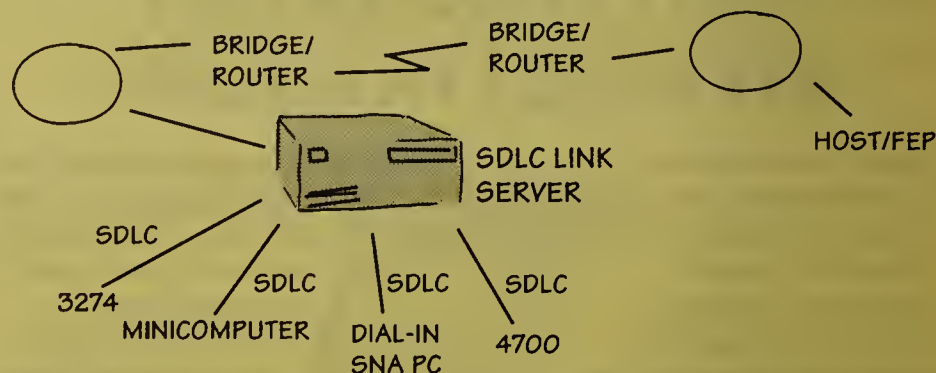
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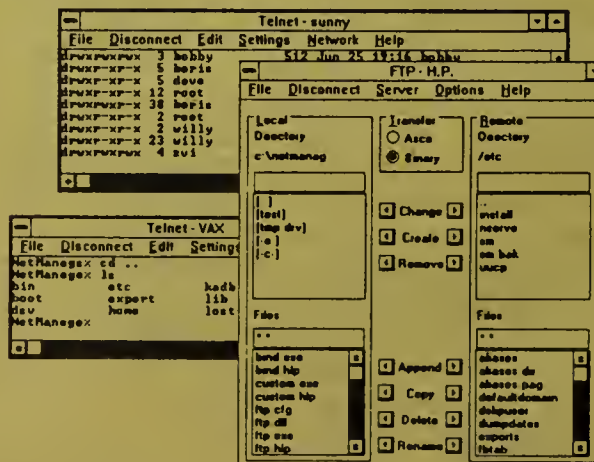
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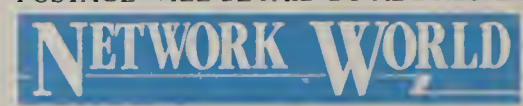


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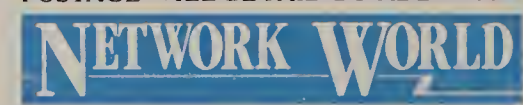


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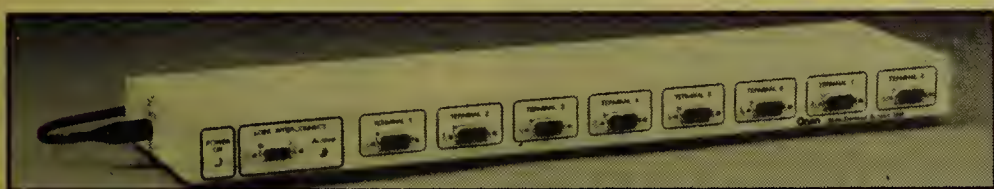
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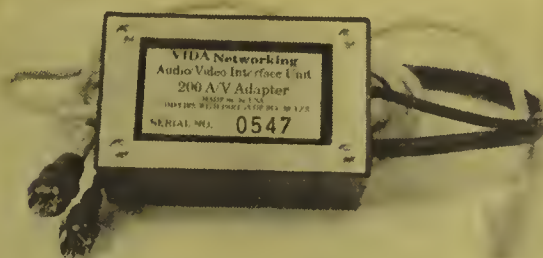
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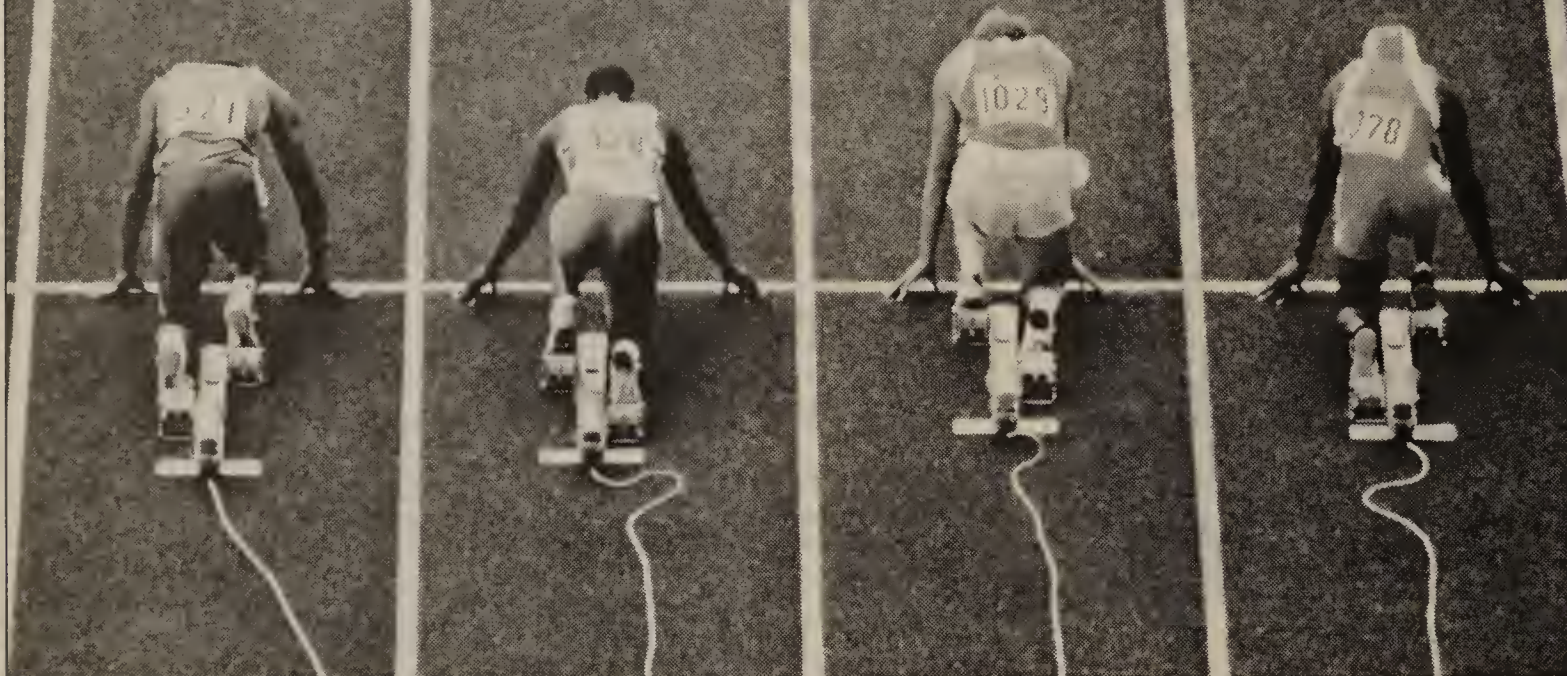
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May 4 (Apr 22 Close); Topic: Internetworking; Special Issue: SNA update; Lead Service

May 11 (Apr 29 Close); Topic: Internetworking; Buyer's Guide: Bridges

May 18 (May 6 Close); Topic: Special Applications; Annual critical issues facing  
users survey; GSPD: Open network management platforms;  
Show Distribution: ICA & Interop East; Lead Service

May 25 (May 13 Close); Topic: WAN; Interexchange carrier billing options

June 1 (May 20 Close); Topic: Internetworking; Buyer's Guide: Hubs; Lead Service

June 8 (May 27 Close); Topic: Applications; Imaging networks

June 15 (June 3 Close); Topic: WAN; Buyer's Guide: Digital private line services,  
Wireless communications; Show Distribution: Supercomm; Lead Service

June 22 (June 10 Close); Topic: LAN; Document management and retrieval;  
Show Distribution: PC Expo; Harvey Study

June 29 (June 17 Close); Topic: WAN/Internetworking; Buyer's Guide:  
T-carrier multiplexers; Show Distribution: DCI Client Server World

July 6 (June 24 Close); Topic: Internetworking; Apple and IBM: One year later;  
Lead Service

July 13 (July 1 Close); Topic: LAN; Buyer's Guide: Disaster recovery and backup

July 20 (July 8 Close); Topic: WAN; The private/public network equation, Buyer's Guide:  
X.25 switches; Show Distribution: ComNet West; Lead Service

July 27 (July 15 Close); Topic: LAN; UNIX and networks



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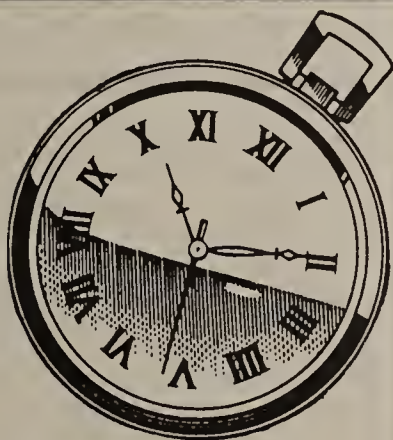
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## IBM airs first server, strategy

*continued from page 1*

print services. The device offers performance above that of an Intel Corp. 386SX-based machine but below that of an 80486-based PS/2.

The next highest level represents what Hauger dubbed as advanced availability servers. It is this category of machines, he said, that have the capabilities necessary to run mission-critical applications.

"In this tier, you'll find [machines with a] fault-tolerant [design but not offering inherent fault tolerance] and features like error-correcting memory and error logging," Hauger said. "In a file server environment, these machines would probably support 200 to 350 clients."

The new machine — officially named the PS/2 Model 95 XP 486 50-MHz server — is being dubbed a "high-availability server," said Nancy Roath, director of personal systems merchandizing at IBM's National Distribution Division. "It has all the characteris-

tics customers are looking for to run mission-critical applications. You wouldn't buy this to run desktop publishing."

Besides offering features to increase reliability like error-checking and error-correction memory, bus parity checking and synchronous channel checking, the device offers increased performance. The Micro Channel Architecture (MCA) bus of the Model 95 XP supports 40M byte/sec data streaming for communications with I/O devices — twice that of current MCA systems.

Available with either a 400M- or 1G-byte Small Computer Systems Interface hard drive, the new systems will be available in July for \$19,995 and \$22,645, respectively.

It is at the highest tier, what Hauger named the fault-tolerant server level, that traditional superserver companies such as NetFRAME Systems, Inc., Parallan Computer, Inc. and Tricord Systems, Inc. compete. It is also at this level that IBM does not offer products — yet.

"There's a specific set of function out there that NetFRAME,

Parallan and Tricord and those sorts of companies have," Hauger said. "If I were to put together a fully robust server prod-

first time that it is looking for partners in that area.

"We're certainly talking to Parallan, but we're not ready to

## IBM's server vision: a 3-tiered approach

### Fault-tolerant servers:

- Hardware-based RAID 5, dual components, multiprocessing capabilities, advanced systems management
- 350 nodes or more
- \$50,000 or more
- Will run true downsized applications that require the system to operate around the clock

### Advanced availability servers:

- Error-correcting memory, high-performance Micro Channel Architecture bus, error logging, software-based RAID 5
- 200 to 350 nodes
- Between \$15,000 and \$50,000
- Will run mission-critical applications that require a high degree of availability and fault tolerance

### "Affordable" servers:

- Include features available with a typical Intel Corp. 80486-based PC
- 10 to 20 nodes
- Between \$5,000 and \$15,000
- Will share resources, such as printers, and run traditional PC applications, such as word processing

RAID = Redundant Array of Inexpensive Disks

SOURCE: IBM, BOCA RATON, FLA.  
GRAPHIC BY SUSAN J. CHAMPENY

uct line, I would like to have that set of function in the third tier."

Although IBM would not provide details on a supposed pending joint announcement with Parallan, it acknowledged for the

disclose exactly what the talks with Parallan consist of," Roath said.

"The visibility of the three tiers will be known by this summer," Hauger said. □

## Agency's net to be cornerstone

*continued from page 1*

SMDS cloud and could establish 45M bit/sec links on an as-needed basis to any other department site on the net.

Sites include Fermi National Accelerator Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Superconducting SuperCollider Center and Oak Ridge National Laboratory.

These sites are supported by today's T-1 ESnet net managed by the Energy Department. Under its plan, all the ESnet sites will be migrated to the fast packet net within three years. In five years, the network is expected to jump from 45M to 155M to 622M bit/sec and support 25 Energy Department sites. The net will initially be Transmission Control Protocol/Internet Protocol-based, but Open Systems Interconnection will eventually be added.

### Agency support

The department's plan for a cell relay-based net has been approved by the Federal Networking Council's Engineering and Operations Working Group. Another agency with NREN funding, the National Aeronautics and Space Administration, will work with the Energy Department on the fast packet network, adding NASA research centers as network sites.

Jim Leighton, manager of networking and distributed computing at Lawrence Livermore's Na-

tional Energy Research and Supercomputing Center, is the primary architect of the Energy Department solicitation. "The goal of NREN is to help bring along new technology," he said. As such, the agency intends to buy services in the developmental stage rather than try to construct a government-owned prototype.

**The Energy  
Department expects to  
spend about \$300,000  
per year on each site  
for the initial T-3  
SMDS network.**

▲▲▲

None of the long-distance carriers have announced 45M bit/sec SMDS services so far, but Leighton said he has been assured that all the major carriers are ready to roll out those services under the Energy Department's proposal. Although AT&T, MCI Communications Corp. and WorldTel declined to say if they would bid on the RFP this week, Sprint Corp. confirmed it would.

The contract vendor will have to provide equipment, including routers, channel service units, SMDS- and SONET-based interface and multiplexing equipment as well as network management

support. The Energy Department expects to spend about \$300,000 per year on each site for the initial T-3 SMDS net.

Steven Wolff, division director for networking at the National Science Foundation (NSF), applauded the project but noted that it represented a gamble that carriers will be able to deliver services in the allotted time.

Recognizing that, the Energy Department RFP asks vendors to provide fallback alternatives. Simple T-3 would be a fallback for T-3 SMDS this year, but the RFP makes it clear the department is not willing to tolerate long-term substitutions.

Wolff noted that ATM technology will offer a high-speed framework for NREN, but he emphasized that NREN must also offer ubiquitous access to educational institutions.

The ESnet fast packet network will not become the new Internet backbone, but it will be tied to it. The contract for the Internet backbone, now supplied by Advanced Network & Services, Inc., expires this fall. Wolff said NSF next week plans to release the proposed backbone RFP for a three-month comment period before issuing a final RFP.

Mike Roberts, vice-president of networking at Educom, a group representing education's interest in NREN, said ATM is viewed as a technology that will support a path to gigabit speeds. He noted that Pittsburgh-based Fore Systems, Inc. already has a product to support ATM over local-area networks. □

## Cisco beefs up pack security

*continued from page 4*

Cisco's SNA product manager. "Before users put their SNA traffic onto a LAN internetwork, they first want a [transport] method that's as reliable as IBM's."

Zadikian said the feature will be especially useful in heavily used, large token-ring internets. Without flow control, congestion caused by network delays can result in lost sessions and even network gridlocks due to bridge/router buffer depletion.

The enhancement prevents packets from being sent to the lo-

**The feature will be  
especially useful in  
heavily used, large  
token-ring internets.**

▲▲▲

cal router until the buffers are emptied, thereby improving network availability. It works by giving the router the capability to send LLC2 receiver-ready and receiver-not-ready commands to locally attached devices.

The flow control software costs from \$450 to \$1,800, depending on router chassis size, and is available as part of the bridging software option for Cisco bridge/routers. □



## Intro pending for SNMP

*continued from page 1*

things such as allow a user to configure a device, as well as enable or disable a device, security becomes a high priority for network administrators," he said.

Inclusion of security as part of the SNMP standard is long overdue, said McCloghrie, who is also a member of the IETF's SNMP working group. Without security, vendors have been reluctant to use SNMP to control their devices, settling instead for basic monitoring functions.

With the new standard on the horizon, internet equipment vendors are now beginning to rethink that position.

Industry heavyweights such as Cabletron Systems, Inc., Cisco Systems, Inc., Proteon, Inc., SynOptics Communications, Inc., 3Com, Ungermann-Bass, Inc. and Vitalink Communications, Inc. say they will implement SNMP control functions as soon as the new standard is available.

Key to the new capabilities is SNMP's SET command, which can be employed to issue commands to devices, such as to change default values and routing tables or set filters and performance parameters.

Several vendors have already added SET command capabilities to their devices but use a proprietary security scheme to ensure user authenticity.

Advanced Computer Communications has been using the full

range of SNMP capabilities in its bridge/routers and net management platform since 1989, while Wellfleet Communications, Inc. will offer the full suite this month ("Wellfleet preps new router mgmt. wares, *NW*, April 20). Both vendors said they will swap out the proprietary security implementation for the SNMP Security Protocol when it is available.

SNMP is equipped with a rudimentary security feature that

ets are sent from authorized users and verifies that no one has tampered with their contents.

The protocol also calls for the Department of Defense's Data Encryption Standard (DES) to encrypt packets so that only authorized recipients can read them. Combined, MD5 and DES will provide SNMP with Data Origin Authentication, Message Integrity and Replay Protection (see graphic, page 51).

### Securing SNMP

The Internet Engineering Task Force this summer is expected to ratify the SNMP Security Protocol. Primary features will include:



#### Data Origin Authentication

Uses an MD5 to prevent users from masquerading as network administrators.



#### Message Integrity

Uses an MD5 to prevent modification of SNMP messages.



#### Replay Protection

Uses the Data Encryption Standard to keep users from reordering, delaying or replaying SNMP messages.

MD5 = Message Digest Algorithm 5

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: SNMP RESEARCH, KNOXVILLE, TENN.

uses a community string, essentially a simple password passed between an SNMP management station and a managed device. But experts warn that community strings are unreliable because they can be easily intercepted.

Jeff Case, president of SNMP Research in Knoxville, Tenn., and coauthor of SNMP, said the SNMP Security Protocol will give users a more reasonable level of security via Message Digest Algorithm 5 (MD5), which ensures that pack-

"Having the ability to not only monitor my net via SNMP, but also control it, will make network administration a lot simpler and more efficient," said Craig Fulgham, network engineer at Fujitsu America, Inc. in San Jose, Calif.

"It's tantamount that security be added with these advanced capabilities," he added. "Adoption of the standard will result in more users jumping on the SNMP bandwagon." □

## HP readies new OpenView

*continued from page 1*

Version 3.0 will support a developers' tool kit, which includes APIs designed to make it easier to build Simple Network Management Protocol applications for OpenView and applications that take advantage of HP's OpenView Windows GUI.

In addition, Version 3.0 also features an improved, DME-compatible OpenView Windows GUI and enhanced autodiscovery capabilities.

### CM-API

OpenView 3.1 is expected to support CM-API, which was jointly developed by HP and Groupe Bull SA. CM-API supports communications between applications and managed objects via SNMP or the Common Management Information Protocol.

Since CM-API is one of the APIs specified in DME, applications written to it should theoretically be able to run on future DME-compatible management systems from HP and other ven-

dors. That, in turn, should entice vendors to write applications to the interface.

According to sources, HP added a standard SNMP API in OpenView 3.0 in order to encourage more vendors to build net management applications that work with OpenView.

Currently, OpenView requires vendors to write to a proprietary API when developing applications that ship data between SNMP agents and HP's Network Node Manager application, sources said.

Network Node Manager runs on top of OpenView and performs fault, configuration and performance management functions on Transmission Control Protocol/Internet Protocol nets.

"By providing direct access to SNMP, HP is repositioning OpenView to gain a larger share of the internetworking market and get vendors to migrate their applications from [SunConnect's SunNet Manager] to OpenView," said one source who requested anonymity.

Version 3.0 will allow users to run either SNMP API or the Network Node Manager API, sources

said, while Version 3.1 will also support CM-API.

OpenView 3.0 also contains an enhanced version of HP's Network Node Manager that will be more closely melded with OpenView. Sources said Network Node Manager will support additional automatic discovery capabilities that will make it easier for network managers to locate and graphically represent nodes.

OpenView 3.0 will support access to Ingres Corp.'s Ingres database management system, sources said. The link will allow management applications to store information on network events in an Ingres database.

An HP spokesman confirmed that OpenView 3.0 would support an enhanced GUI, the SNMP API and the developers' tool kit. However, he declined to comment on reports that Version 3.0 would provide access to an Ingres SQL database and contain extensions to Network Node Manager. The spokesman also declined to discuss Version 3.1.

Current users of OpenView can upgrade to Version 3.0 at no charge, sources said, although HP would not confirm this. □

## SNA devices attach to LANs

*continued from page 4*

lects downstream SDLC data and makes it available to NetView," McConnell said. "It's a feature glasshouse managers need."

Netlink will also unveil InView, which is software that runs on a LAN-attached personal computer and enables an administrator to monitor performance and update SDLC Link Server configurations across a network.

### Ideal for remote locations

Analysts said Ethernet and token-ring support, along with the new network management features, make the SDLC Link Server a possible replacement for small IBM 3745 front-end processors in remote locations.

Many users utilize the 3745 in remote locations for the same functions the SDLC Link Server provides at a quarter of the cost,

they said.

Using the device also obviates the need to add token-ring adapters to controllers.

"If the user wants native SNA communications, they can add token-ring boards at about \$2,000 each to every [controller] in the enterprise," Boyle said. "Or they can use the Netlink box for less money."

A user can also boost network performance by upgrading the 9.6K bit/sec multidrop connections to 19.2K bit/sec.

Release 1.1 features are available in SDLC Link Servers that ship after May 29. Existing users can upgrade for free.

SDLC Link Server is available in three models.

Model 1 supports two SDLC ports and sells for \$6,490, while Model 2 has four SDLC ports and costs \$9,450. Model 3 ships with four SDLC ports, which are expandable to 16, and sells for \$10,695. □

## Infonet readies global service

*continued from page 4*

Infonet would not confirm plans for the service. But sources said the new service will support Synchronous Data Link Control traffic, as well as Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. DECnet and Novell, Inc. Internetwork Packet Exchange (IPX) packets. It will also support source route bridging and be upgraded to support IBM's Advanced Peer-to-Peer Networking.

The service will initially support speeds of 9.6K, 14.4K, 19.2K and up to 56K/64K bit/sec. It will later handle up to T-1/E-1 beginning early next year.

Sources said Infonet is weighing a number of options for providing the new service on its global network and is expected to make a decision by mid-summer.

As one option for supporting SNA traffic, the value-added network provider could upgrade the software in the Cisco Systems, Inc. routers that anchor its Infolan router-based LAN interconnection service.

Alternatively, Infonet could provide users with protocol converters that would take SDLC traffic from LAN-attached SNA devices, such as cluster controllers, and convert it to Ethernet or token-ring protocols.

Infonet expects to begin testing its new service at selected sites later this year. The offering will be available in 18 countries by the fourth quarter of 1992, sources said. Geographic coverage will then be expanded in early 1993.

Fixed regional and global pric-

ing will be offered. Users that sign up for the service will receive a fixed-cost service bill from Infonet covering the transport of unlimited data traffic. □

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We might as well tell you right now. The new GatorBox® CS doesn't just compete with other AppleTalk-Ethernet gateways.

It eats them for breakfast.

Especially now that GatorBox CS supports DECnet™ for Mac-to-VAX/VMS networking and PATHWORKS services like terminal emulation, file sharing, printing and X windows.

### How we attack reliability.

The new GatorBox CS is more reliable than even we thought possible.

And as network managers of some of the country's largest networks can attest, we've been known to make some *very* reliable gateways.

For one thing, there's a very



# ANY OTHER GATEWAY WOULD NEVER MAKE IT OUT OF THIS AD ALIVE.

## GatorBox CS vs FastPath 5

Feature	GatorBox CS	FastPath 5
AppleTalk-Ethernet gateway	■	■
TCP/IP, MacTCP and IP/Talk support	■	■
DECnet Phase IV support	■	■
AppleTalk Phase 1 and 2 support	■	■
Thin, thick or 10BaseT Ethernet	■	■
Configuration, monitoring and upgrades from anywhere on network	■	■
SNMP and atalkd support	■	■
Seed, non-seed and soft-seed routing	■	■
AppleTalk tunneling over IP backbone	■	■
Remote gateway status via telnet	■	■
Out-of-band hardware diagnostics	■	■
Diagnostics written to UNIX syslog file	■	■
2 MB memory	■	■
Optional AppleShare-NFS file sharing	■	■
Optional UNIX-AppleTalk printing	■	■
Overnight replacement policy	■	■
Hardware warranty	2 years	1 year
Suggested retail price	\$2,795	\$2,799

generous 2 MB of memory, making GatorBox CS particularly well-suited to high-traffic networks. And because the GatorBox

CS has built-in flash EPROM, it can recover from power outages or network failures quickly and without intervention.

Even the housing is designed to take the heat off network managers. Thanks to its vertical air flow construction, GatorBox CS runs at substantially cooler operating temperatures.

### A killer support program.

With GatorBox CS, there's a 2-year warranty on the hardware. Not to mention guaranteed overnight replacement.

Plus, you automatically get the most experienced, most responsive service and support team in the business. Quite frankly, no one knows more about connecting AppleTalk, TCP/IP and DECnet

environments.

### Taming the wiring beast.

Now, with GatorBox CS/Rack for 19-inch rack mount environments and GatorMIM™ CS, for Cabletron's Multi Media Access



Center™, it's simple to integrate AppleTalk into structured wiring environments.

You want to talk versatility? How about GatorBox application software. Like GatorShare™ and GatorPrint™ so you can take advantage of Mac-to-Unix file sharing and printing regardless of which GatorBox you're using.

GatorBox CS. You'll wonder how your network ever survived without it. Call 1-800-473-4776, 617-494-1999 or fax, 617-494-9270. Or write Cayman Systems, 26 Landsdowne St., Cambridge, MA 02139.



NOW WITH DECNET™.